

Supplementary appendix

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WEB-ONLY SUPPLEMENT

Pharmacological blood pressure lowering for primary and secondary prevention of cardiovascular disease across different levels of blood pressure: an individual participant-level data meta-analysis

The Blood Pressure Lowering Treatment Trialists' Collaboration

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Trial acronym legend

Trial acronym	Full name/Description
AASK	African American Study of Kidney Disease and Hypertension
ABCD	Appropriate Blood Pressure Control in Diabetes
ACCORD	Action to Control Cardiovascular Risk in Diabetes blood pressure trial
ACTIVE I	Atrial Fibrillation Clopidogrel Trial with Irbesartan for Prevention of Vascular Events
ADVANCE	Action in Diabetes and Vascular disease: preterAx and diamicroN-MR Controlled Evaluation
ALLHAT	Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial
ANBP	Australian National Blood Pressure Study
ANBP2	Second Australian National Blood Pressure Study
ASCOT-BPLA	Anglo-Scandinavian Cardiac Outcomes Trial-Blood Pressure Lowering Arm
BENEDICT	BErgamo NEphrologic DIabetes Complications Trial
CAMELOT	Comparison of Amlodipine vs Enalapril to Limit Occurrences of Thrombosis
CAPP	Captopril Prevention Project
Cardio-Sis	Studio Italiano Sugli Effetti Cardiovascolari del Controllo della Pressione Arteriosa Sistolica
CASE-J	Candesartan Antihypertensive Survival Evaluation in Japan Trial
COLM	Combination of OLMesartan study
CONVINCE	Controlled ONset Verapamil INvestigation of Cardiovascular Endpoints trial
COPE	Combination Therapy of Hypertension to Prevent Cardiovascular Events
DIABHYCAR	Noninsulin-dependent diabetes, hypertension, microalbuminuria or proteinuria, cardiovascular events, and ramipril
Dutch TIA Trial	Dutch Transient Ischemic Attack Trial
E-COST	Efficacy of Candesartan on Outcome in Saitama Trial
ELSA	European Lacidipine Study on Atherosclerosis
EUROPA	EUropean trial on Reduction Of cardiac events with Perindopril in patients with stable coronary Artery disease
EWPHE	European Working Party on High Blood Pressure in the Elderly
HIJ-CREATE	Heart Institute of Japan Candesartan Randomized Trial for Evaluation in Coronary Artery Disease
HOMED-BP	Hypertension Objective Treatment Based on Measurement by Electrical Devices of Blood Pressure
HOPE	Heart Outcomes Prevention Evaluation
HYVET	Hypertension in the Very Elderly Trial
IDNT	Irbesartan Diabetic Nephropathy Trial
INSIGHT	International Nifedipine GITS study: Intervention as a Goal in Hypertension Treatment
INVEST	International Verapamil-Trandolapril Study
JMIC-B	Japan Multicenter Investigation for Cardiovascular Diseases-B
LIFE	Losartan Intervention For Endpoint reduction
MOSES	Morbidity and Mortality After Stroke, Eprosartan Compared With Nitrendipine for Secondary Prevention
NICS-EH	National Intervention Cooperative Study in Elderly Hypertensives
NORDIL	Nordic Diltiazem Study
ONTARGET	Ongoing Telmisartan Alone and in Combination with Ramipril Global Endpoint Trial
PART 2	Prevention of Atherosclerosis with Ramipril Trial
PEACE	Prevention of Events with Angiotensin Converting Enzyme Inhibition
PREVEND IT	Prevention of Renal and Vascular Endstage Disease Intervention Trial
PREVENT	Prospective Randomized Evaluation of the Vascular Effects of Norvasc Trial
PROFESS	Prevention Regimen for Effectively Avoiding Second Strokes
PROGRESS	Perindopril Protection Against Recurrent Stroke Study
SHEP	Systolic Hypertension in the Elderly Program
SPRINT	Systolic Blood Pressure Intervention Trial
STOP	Swedish Trial in Old Patients with Hypertension-2
Hypertension-2	
Syst-Eur	Systolic Hypertension in Europe
TRANSCEND	Telmisartan Randomized Assessment Study in ACE Intolerant Subjects with Cardiovascular Disease
UKPDS	UK Prospective Diabetes Study
VALISH	Valsartan in Elderly Isolated Systolic Hypertension
VALUE	Valsartan Antihypertensive Long-term Use Evaluation
VHAS	Verapamil in Hypertension and Atherosclerosis Study

Method S1. Standardisation of proportional effects

Standardisation of effect sizes is appropriate when the aim is pooling the effect of blood pressure-lowering treatment on cardiovascular outcomes and expressing the effect for a fixed level of blood pressure reduction.¹⁻⁴ This approach is also underpinned by the fact that relative risk reductions for all major cardiovascular outcomes have been shown to be linearly associated with the magnitude of the blood pressure reductions achieved at a trial level, as evidenced in the meta-regression in this paper and previous work.³ The added advantage of standardisation is that it enables the inclusion of a wide range of trials of pharmacological blood pressure management without setting an arbitrary threshold for the achieved trial-level of blood pressure reduction.

To determine the level of risk reduction for a uniform change in blood pressure, it is essential to standardise the effect sizes for a predefined and clinically meaningful blood pressure level. The average systolic blood pressure reduction between randomised groups, excluding the first 12 months, amongst all included trials was 6.3 mmHg (95% confidence interval [CI] 6.4 to 6.1).⁵ We, therefore, standardised the proportional effect sizes to a 5 mmHg difference in systolic blood pressure between treatment arms, as a convenient round number close to the average blood pressure reduction. More specifically, we used the Cox proportional hazard models, including the following terms:

Treatment: a binary variable for treatment (0 comparator, 1 intervention); delta: systolic blood pressure reduction for each trial as continues variable, CVD: previous cardiovascular disease status (0 non CVD at baseline, 1 CVD at baseline), SBP_cat: categories of systolic blood pressure at baseline coded as 0 to 7 (<120, 120-129, 130-139, 140-149, 150-159, 160-169, and ≥170 mmHg).

- Overall model: Treatment + delta + (Treatment × delta)
- Model for prior cardiovascular disease status as interaction: Treatment + delta + (Treatment × delta) + (Treatment × CVD) + (Treatment × delta × CVD)
- Model for systolic blood pressure categories at baseline, in patients with and without prior cardiovascular disease: For this model, we first split the dataset into independent datasets based on previous cardiovascular disease at baseline (CVD). Then we ran the model: Treatment + delta + (Treatment × delta) + (Treatment × SBP_cat) + (Treatment × delta × SBP_cat)

Although other methods have been used to standardise estimates for the intensity of blood pressure reduction in aggregate level,¹⁻⁴ in one-stage individual participant data meta-analysis models, the more appropriate approach is including standardisation as part of the main model. In a sensitivity analysis, the standardised estimate of hazard ratio from the two-stage meta-analysis was the same with our chosen one-stage method, supporting the robustness of our one-stage modelling approach.

Table S1. Characteristics of randomised clinical trials included in the analysis.

Trial	Type of trial	Setting	Age (years) mean (SD)	Follow-up duration (years)	Intervention	Comparator	Previous CVD At baseline (CVD/non-CVD)	Definition of Primary outcome	SBP difference (mmHg) excluding first 12 months	Inclusion criteria		Exclusion criteria
										No. of participants	No. of participants	No. of participants
AASK ⁶	Intensive	USA	54 (11)	4.8	More intensive (540)	Less intensive (554)	564/530	MI, Stroke, HF, CVD death	13.0	Age 18-70 years, African-American, hypertension, renal disease (GFR=20-65 ml/min per 1.73m ²)	DBP <95 mmHg, diabetes, urine protein:creatinine ratio >25, recent malignant or hypertension, non-blood pressure-related CKD, serious systemic disease, heart failure	
ABCD ⁷	Intensive	USA	58 (8)	4.7	More intensive (474)	Less intensive (476)	89/861	MI or IHD, Stroke, HF, CVD death	7.7	Age 0-74 years, with T2D, DBP ≥80 mmHg, not on antihypertensive treatment	Recent CAD or CeVD, heart failure, renal disease	
ACCORD ⁸	Intensive	USA and Canada	63 (7)	4.7	More intensive (2362)	Less intensive (2371)	900/3833	IHD or non-fatal MI, Stroke, HF, CVD death	13.9	Age ≥40y years with CVD or ≥50 years with substantial atherosclerosis, T2D, HbA1c ≥7.5%, albuminuria, LVH or ≥2 CeVD risk factors (dyslipidaemia, hypertension, smoking, obesity); SBP 130-180 mmHg and taking ≤3 antihypertensive drugs, 24- hour protein excretion rate <1g	Body mass index ≥45 kg/m ² , serum creatinine ≥132.6 μmol/l and other serious illness	
ACTIVE I ⁹	Placebo-controlled	Multi-country	70 (10)	4.1	ARB (3058)	Placebo (3076)	1890/4244	MI, Stroke, HF, CVD death	2.6	Atrial fibrillation, ≥1 risk factor (age ≥75 years, on antihypertensive treatment, history of stroke, TIA or non-CNS embolism, LVEF <45%, PVD, or age 55-74 years with either CAD or diabetes)	Use of anticoagulant, peptic ulcer disease in past 6 months, history of intracerebral haemorrhage, thrombocytopaenia or mitral stenosis	
ADVANCE ¹⁰	Placebo-controlled	Multi-country	66 (6)	4.2	ACEI and Diuretic (5569)	Placebo (5571)	3461/7679	MI, Stroke, HF, CVD death	5.4	Age ≥55 years T2D (diagnosed aged ≥30y), ≥1 major CVD or ≥1 CVD risk factor (microvascular disease, smoking, dyslipidaemia, microalbuminuria, T2D for ≥10 years, age ≥65 years)	HbA1c target (≤6.5%), definite indication for long-term insulin therapy	
ALLHAT ¹¹	Drug classes comparison	Multi-country	67 (8)	4.8	Diuretic (15255)	ACEI, CCB and Alpha-blockers (27163)	5470/36948	MI or IHD, Stroke, HF, CVD death	2.0	Age ≥55 years stage 1 or 2 hypertension plus ≥1 risk factor (MI or stroke >6 months previously, left ventricular hypertrophy, T2D, smoking, HDL <0.91 mmol/l), other atherosclerotic CVD	Symptomatic or hospitalisation for heart failure, LVEF <35%	
ANBP ¹²	Placebo-controlled	Australia	50 (9)	3.6	Diuretic (1721)	Placebo (1706)	16/3411	MI or IHD, Stroke, HF, CVD death	7.5	Age 30-69 years with mild hypertension (DBP 95-110 mmHg and SBP <200 mmHg)	Antihypertensive treatment in past 3 months, recent angina or MI, stroke, hormone therapy, asthma, diabetes, gout, serious disease, tricyclic antidepressant use	
ANBP2 ¹³	Drug classes comparison	Australia	73 (5)	4.1	Diuretic (3039)	ACEI (3044)	474/5609	MI or IHD, Stroke, HF, CVD death	0.9	Age 65-84 years, SBP ≥160 mmHg or DBP ≥90 mmHg (if SBP ≥140 mmHg), no recent CVD	Serious illness, plasma creatinine >221 μmol/l, malignant hypertension, dementia	
ASCOT- BPLA ¹⁴	Drug classes comparison	Multi-country	63 (9)	5.3	CCB-based (9639)	Beta-blocker based (9618)	7008/12249	MI or IHD, Stroke, HF, CVD death	2.2	Age 40-79 years, untreated (SBP ≥160 or DBP ≥100 mmHg) or treated hypertension (SBP ≥140 or DBP ≥90 mmHg), ≥3 CVD risk factors (documented LVH, abnormal ECG, T2D, PAD, previous stroke or TIA, male sex, age ≥55 years, microalbuminuria or proteinuria, smoking, TC:HDL ≥6, family history of premature coronary heart disease)	Previous MI, current treatment for angina, recent CeVD, fasting triglycerides >4.5 mmol/l, heart failure, arrhythmia, haematological or biochemical abnormality at screening	
BENEDICT ¹⁵	Placebo-controlled	Italy	62 (8)	3.1	ACEI, CCB and ACEI/CCB (904)	Placebo (300)	Not available	MI or IHD, Stroke, HF, CVD death	1.3	Age ≥40 years, untreated SBP ≥130 / DBP ≥85 mmHg or needing treatment to attain below these levels, T2D for <25 years, urinary albumin excretion rate <20 μg/min, serum creatinine ≤133 μmol/l	HbA1c ≥11%, nondiabetic renal disease	
CAMELOT ¹⁶	Placebo-controlled	Multi-country	58 (10)	1.6	CCB and ACEI (1340)	Placebo (657)	1858/139	MI, non-fatal Stroke, HF, CVD death	5.3	Age 30-79 years, coronary artery stenosis >20% by angiography, DBP <100 mmHg	Left middle coronary artery obstruction >50%, LVEF <40%, heart failure	
CAPP ¹⁷	Drug classes comparison	Sweden and Finland	52 (8)	5.8	Beta-blocker and/or Diuretic (5493)	ACEI (5492)	351/10634	MI or IHD, Stroke, CVD death	2.2	Age 25-66 years, DBP ≥100 mmHg on two occasions	Secondary hypertension, serum creatinine >150 μmol/, condition requiring β-blocker treatment	
CARDIO-SIS ¹⁸	Intensive	Italy	67 (7)	4.7	More intensive (558)	Less intensive (553)	202/909	MI, Stroke, HF	3.8	Age ≥55 years, SBP ≥150 mmHg, taking antihypertensive drug ≥12 weeks, ≥1 CV risk factor (smoking, dyslipidaemia, family history of premature CVD, prior TIA or stroke, established CAD or PAD)	Fasting blood glucose ≥7 mmol/l, diabetes, serious conditions, renal disease, valvular heart disease, left ventricular hypertrophy, atrial fibrillation, substance misuse.	
CASE-J ¹⁹	Drug classes comparison	Japan	64 (11)	3.1	CCB (2349)	ARB (2354)	1028/3675	MI, Stroke, HF, CVD death	1.7	Age 20-85 years, ≥1 high-risk factor: SBP ≥180 or DBP ≥110 mmHg, T2D, history of angina pectoris, MI, stroke, TIA >6 months prior to screening, LVH, proteinuria or serum creatinine ≥1.3 mg/100 ml, peripheral artery obstruction	BP ≥200/120 mmHg, T1D, heart failure, ejection fraction <40%, atrial fibrillation, cancer	
COLM ²⁰	Drug classes comparison	Japan	74 (5)	3.0	ARB and Diuretic (2573)	ARB and CCB (2568)	1225/3916	MI, Stroke, HF, CVD death	0.3	Age 65-84 years, hypertension (treated: BP ≥140/90 mmHg; untreated: BP ≥160/100 mmHg), CVD history or CVD risk factors (diabetes, dyslipidaemia)	Secondary/malignant hypertension, recent major CVD, revascularisation, angina pectoris hospitalisation or severe heart failure, atrial fibrillation, hepatic or renal dysfunction	

CONVINCE²¹	Drug classes comparison	Multi-country	66 (7)	2.8	CCB (8179)	Beta-blocker or Diuretic (8297)	4458/12018	MI or IHD, Stroke, HF, CVD death	0.0	Age ≥55 years, hypertension, ≥1 CVD risk factor (e.g., diabetes, smoking)	Heart failure, dysrhythmia, secondary hypertension, recent MI or stroke, renal disease, other serious disease, BP ≥190/110 mmHg without treatment
COPE²²	Drug classes comparison	Japan	64 (11)	3.6	CCB/Diuretic and CCB/ Beta-blocker (2183)	CCB and ARB (1110)	219/3074	MI, Stroke, HF, CVD death	0.4	Age 40-85 years, BP ≥140/90 mmHg	SBP ≥200 or DBP ≥120 mmHg, secondary hypertension, diabetes, recent CVD or revascularisation, heart failure, atrial fibrillation/flutter, hepatic or renal dysfunction, congenital or rheumatic heart disease, cancer
DIABHYCAR²³	Placebo-controlled	Multi-country	65 (8)	3.9	ACEI (2443)	Placebo (2469)	739/4173	MI, Stroke, HF, CVD death	0.9	Age ≥50 years, T2D, urinary albumin excretion ≥20 mg/l in two consecutive urine samples	Serum creatinine >150 µmol/l, use of insulin, ACEI or ARB, heart failure, recent MI, urinary tract infection
Dutch TIA Trial²⁴	Placebo-controlled	The Netherlands	64 (10)	2.3	Beta-blocker (732)	Placebo (741)	1473/0	non-fatal MI or IHD, Stroke, CVD death	3.1	TIA or non-disabling ischaemic stroke (Rankin Scale ≤3) in past 3 months	Cerebral ischaemia from identifiable causes other than arterial thrombosis or embolism
E-COST²⁵	Drug classes comparison	Japan	64 (11)	3.1	ARB (1053)	Conventional (995)	213/1835	Not available	Not available	Age 35-79 years, BP 140-180/90-110 mmHg	Diabetes, dysglycemia, secondary hypertension, recent MI or stroke, angina pectoris requiring β-blocker treatment, heart failure, left ventricular ejection fraction <40%
ELSA²⁶	Drug classes comparison	Multi-country	57 (7)	3.4	CCB (1177)	Beta-blocker (1157)	305/2029	MI or IHD, Stroke, HF, CVD death	0.8	Age 45-79 years, BP 150-210/95-115 mmHg	Recent MI or stroke, and T2D
EUROPA²⁷	Placebo-controlled	Multi-country (Europe)	61 (9)	4.2	ACEI (6110)	Placebo (6108)	12218/0	MI, Stroke, HF	4.6	Age ≥18 years, documented MI >3 months before screening, revascularisation >6 months before screening, >70% coronary obstruction	Heart failure, hypotension, uncontrolled hypertension, renal insufficiency, serum potassium >5.5 mmol/L
EWPHE²⁸	Placebo-controlled	Multi-country	71 (8)	4.6	Diuretic (416)	Placebo (424)	124/716	MI, Stroke, HF, CVD death	22.4	Age ≥60 years, BP 160-239/90-119 mmHg	Curable causes of high BP, retinopathy, heart failure, stroke history, hepatitis/cirrhosis, gout, malignancy, diabetes requiring insulin treatment
HIJ-CREATE²⁹	Drug classes comparison	Japan	65 (9)	4.0	ARB (1024)	non-ARB (1025)	2049/0	MI, Stroke, HF, CVD death	0.4	Age 20-80 years, CAD hospitalisation and hypertension (BP ≥140/90 mmHg or antihypertensive treatment use)	Secondary hypertension, recent AMI or CeVD, severe aortic valve stenosis, cardiomyopathy, serum creatinine >2 mg/dl, serum potassium >5 mmol/l, hepatic dysfunction, malignancy
HOMED-BP³⁰	Intensive	Japan	60 (10)	4.9	More intensive (1759)	Less intensive (1759)	106/3412	MI, Stroke, HF, CVD death	2.0	Self-measured SBP 135-179 mmHg or DBP 85-119 mmHg, but not if DBP <65 or SBP <110 mmHg (clinic SBP <220 mmHg and DBP <125 mmHg)	None specified
HOPE³¹	Placebo-controlled	Multi-country	66 (7)	4.5	ACEI (4645)	Placebo (4652)	7477/1820	MI, Stroke	3.0	Age ≥55 years, CAD, stroke, PVD or diabetes, plus ≥1 risk factor (hypertension, dyslipidaemia, smoking, or documented microalbuminuria)	Heart failure, left ejection fraction <40%, using ACEI or Vitamin E, uncontrolled hypertension, nephropathy, or recent MI or stroke
HYVET³²	Placebo-controlled	Multi-country	84 (3)	2.1	Diuretic (1933)	Placebo (1912)	374/3471	MI, Stroke, HF, CVD death	13.1	Age ≥80 years, sustained SBP ≥160 mmHg	Accelerated or secondary hypertension, recent haemorrhagic stroke, heart failure, serum creatinine >150 µmol/L, serum potassium <3.5 or >5.5 mmol/L, gout, and dementia
IDNT³³	Placebo-controlled	USA	59 (8)	2.6	ARB and CCB (1146)	Placebo (569)	Not available	Not available	2.8	Age 30-70 years, T2D, hypertension (BP ≥135/85 mmHg or taking anti-hypertensive drug), proteinuria, serum creatinine (µmol/l): 88 to 265 (women) or 106 to 265 (men)	None specified
INSIGHT³⁴	Drug classes comparison	Multi-country	65 (6)	2.8	Diuretic (3164)	CCB (3157)	671/5650	MI, Stroke, fatal HF, CVD death	1.1	Age 55-80 years, hypertensive (SBP ≥150 or DBP ≥95 mmHg, or SBP ≥160 mmHg), ≥1 other risk factor (TC ≥6.43 mmol/l, smoking, family history of premature MI, CAD, other CVD	None specified
INVEST³⁵	Drug classes comparison	Multi-country	66 (10)	2.8	CCB (10648)	non-CCB (10672)	21320/0	MI or IHD, Stroke, HF, CVD death	0.1	Age ≥50 years, documented CAD, essential hypertension requiring drug therapy, heart failure Class I-II ^b	Patients taking β-blocker within two weeks of randomization or for recent MI
JMIC-B³⁶	Drug classes comparison	Japan	65 (85)	2.3	CCB (828)	ACEI (822)	1650/0	MI or IHD, Stroke, HF, CVD death	2.0	Age <75 years, hypertension (BP ≥160/≥95 mmHg or both SBP ≥150 and DBP ≥90 mmHg, or antihypertensive treatment), CAD or meeting both criteria: history of >2 anginal attacks per week with stable frequency and ST-segment depression of ≥1 mm on stress test (or detection of MI with myocardial scintigraphy)	MI, unstable angina, DBP ≥120 mmHg, secondary hypertension, symptomatic CeVD, heart failure, atrial fibrillation/arrhythmias, renal or hepatic dysfunction, uncontrollable diabetes and familial hypercholesterolaemia
LIFE³⁷	Drug classes comparison	Multi-country	67 (7)	4.9	ARB (4605)	Beta-blocker (4588)	1771/7422	MI or IHD, Stroke, HF, CVD death	1.2	Age 55-80 years, hypertension (SBP 160-200 mmHg; DBP 95-115 mmHg), electrocardiogram signs of LVH	Secondary hypertension, recent MI or stroke, angina pectoris requiring treatment, heart failure or left ejection fraction <40%
MOSES³⁸	Drug classes comparison	Germany and Austria	68 (10)	3.3	CCB (671)	ARB (681)	1352/0	MI or IHD, Stroke, HF, CVD death	1.5	Hypertension requiring treatment, documented TIA, ischaemic stroke or cerebral haemorrhage	Internal carotid artery occlusion or stenosis >70%, heart failure, age >85 years, on anticoagulant for cardiac arrhythmia, high-grade aortic or mitral valve stenosis, unstable angina
NICS-EH³⁹	Drug classes comparison	Japan	70 (7)	3.2	Diuretic (214)	CCB (215)	16/401	MI or IHD, Stroke, HF, CVD death	0.3	Age ≥60 years, SBP 160-220 mmHg and DBP <115 mmHg and no cardiovascular complications	None specified

NORDIL⁴⁰	Drug classes comparison	Norway and Sweden	60 (7)	4.2	Beta-blocker and/or Diuretic (5471)	CCB (5410)	740/10141	MI or IHD, Stroke, CVD death	3.3	Age 50-74 years, untreated hypertension (DBP ≥100 mmHg on two occasions); if previously treated, DBP ≥100 mmHg on two consecutive visits at one week apart during run-in period and no treatment was given	Age <50 or ≥70y, bradycardia, secondary hypertension, atrial fibrillation, recent CeVD or MI, heart failure
ONTARGET⁴¹	Drug classes comparison	Multi-country	67 (7)	4.8	ARB/ACEI (8502)	ACEI and ARB (17118)	22315/3301	MI or IHD, Stroke, HF, CVD death	1.9	CAD, PAD, CeVD or diabetes with end-organ damage	Heart failure, pericarditis, congenital heart disease, unexplained syncope , planned revascularisation <3 months of consent, uncontrolled hypertension, heart transplant, subarachnoid haemorrhage, renal artery disease, proteinuria, hepatic dysfunction, volume or sodium depletion, primary hyper-aldosteronism, hereditary fructose intolerance, other serious conditions
PART 2⁴²	Placebo-controlled	New Zealand	60 (8)	4.6	ACEI (308)	Placebo (309)	457/160	MI or IHD, Stroke, HF, CVD death	6.5	Age ≤75 years, diagnosis (in past 5 year) of MI, documented CAD, TIA or intermittent claudication	Heart failure, serious nonvascular disease, SBP >160 mmHg, DBP >100 mm Hg, DBP <100 mmHg during pre-randomization run-in period
PEACE⁴³	Placebo-controlled	Multi-country (USA, Puerto Rico, Canada and Italy)	64 (8)	4.7	ACEI (4158)	Placebo (4132)	8290/0	non-fatal MI, non-fatal stroke, HF, CVD death	3.0	Age ≥50 years, documented CAD	Unstable angina, severe valvular heart disease, recent revascularisation, planned elective revascularisation, limited 5-year survival, serum creatinine >177 µmol/l, serum potassium >5.5 mmol/l
PREVEND IT⁴⁴	Placebo-controlled	The Netherlands	51 (12)	3.8	ACEI (431)	Placebo (433)	24/840	MI, Stroke, HF, CVD death	5.6	Microalbuminuria, SBP <160/100 mmHg (no previous antihypertension treatment)	Creatinine clearance <60% of normal age-adjusted value
PREVENT⁴⁵	Placebo-controlled	USA and Canada	57 (10)	3.0	CCB (417)	Placebo (408)	825/0	MI, Stroke, HF, CVD death	6.1	Age 30-80 years, documented CAD, DBP <95 mmHg, cholesterol <325 mg/dl, fasting blood glucose <200 mg/dl	Contraindication for dihydropyridines, uncontrolled hypertension, diabetes and other major illness
PROFESS⁴⁶	Placebo-controlled	Multi-country	66 (8)	2.5	ARB (9873)	Placebo (9925)	19798/0	MI or IHD, Stroke, HF, CVD death	3.4	Age ≥55 years with ischaemic stroke <90 days before randomization (later modified to include age 50 to 54 years or had stroke 90 to 120 days before randomisation if with ≥2 additional risk factors: diabetes, hypertension, smoker, obesity previous CVD, end-organ damage or hyperlipidaemia) and remained stable	Haemorrhagic stroke, severe disability after the qualifying stroke, contraindication to treatments
PROGRESS⁴⁷	Placebo-controlled	Multi-country (Asia, Australasia, Europe)	64 (10)	3.9	ACEI and/or Diuretic (3051)	Placebo (3054)	6105/0	MI or IHD, Stroke, HF, CVD death	9.2	Stroke or TIA in past 5 years	Indication or contraindication for ACEI
SHEP⁴⁸	Placebo-controlled	USA	72 (7)	5.0	Beta-blocker and Diuretic (2365)	Placebo (2371)	284/4441	non-fatal MI, non-fatal Stroke, CVD death	12.8	Age ≥60 years, isolated systolic hypertension (BP 160-219/≤90 mmHg, not on treatment)	Major CVD, cancer, alcoholic liver disease, renal dysfunction, competing risk of SHEP primary endpoint or presence of medical management exclusions
SPRINT⁴⁹	Intensive	USA and Puerto Rico	68 (9)	3.0	More intensive (4678)	Less intensive (4683)	1877/7484	MI or IHD, Stroke, HF, CVD death	14.9	Age ≥50y years, SBP 130-180 mmHg, increased CVD risk (clinical/subclinical CVD other than stroke, CKD excluding polycystic kidney disease and with eGFR of 20-60 ml/min/1.73m ² body surface area, 10-year Framingham CVD risk ≥15%, age ≥75y)	Diabetes or prior stroke
STOP Hypertension-2⁵⁰	Drug classes comparison	Sweden	76 (4)	4.5	Beta-blocker and/or Diuretic (2213)	ACEI and CCB (4401)	1072/5542	MI or IHD, Stroke, HF, CVD death	2.1	Aged 70-84 years, SBP ≥180 mmHg and/or DBP ≥105 mmHg	Not specified
SYST-EUR⁵¹	Placebo-controlled	Multi-country	70 (7)	2.6	CCB (2398)	Placebo (2297)	286/4409	MI or IHD, Stroke, HF, CVD death	10.1	Age ≥60 years, sitting SBP 160-219 mmHg, sitting DBP <95 mmHg, and standing SBP ≥140 mmHg	Secondary hypertension, retinal haemorrhage/papilloedema, heart failure, dissecting aortic aneurysm, serum creatinine ≥180 µmol/l, recent severe nosebleeds, stroke or MI, dementia, disorders prohibiting standing position, severe CVD/non-CVD
TRANSCEND⁵²	Placebo-controlled	Multi-country	68 (7)	4.9	ARB (2954)	Placebo (2972)	5222/701	MI or IHD, Stroke, HF, CVD death	4.5	Intolerant to ACEI and with established CAD, PVD, CeVD or diabetes with end-organ damage	Heart failure, valvular/cardiac outflow tract obstruction, pericarditis, congenital heart disease, unexplained syncope, recent revascularisation, SBP >160 mmHg, heart transplantation, subarachnoid haemorrhage, significant renal stenosis, renal or hepatic dysfunction
UKPDS⁵³	Intensive	UK	56 (8)	7.9	More intensive (758)	Less intensive (390)	35/1113	MI or IHD, Stroke	11.2	Age 25-65 years, newly diagnosed diabetes, and hypertension (untreated: SBP ≥160 mmHg and/or DBP ≥90 mmHg; treated: SBP ≥150 mmHg and/or DBP ≥85 mmHg)	Ketonuria, recent MI, angina, heart failure, >1 major vascular episode, serum creatinine >15 µmol/l, retinopathy, malignant hypertension, uncorrected endocrine abnormality, severe concurrent illness
VALISH⁵⁴	Intensive	Japan	76 (4)	2.6	More intensive (1545)	Less intensive (1534)	371/2708	MI, Stroke, HF, CVD death	5.0	Age ≥70 to <85 years, isolated hypertension (SBP >160 mmHg and DBP <90 mmHg)	Secondary or malignant hypertension, BP ≥200/≥90 mmHg, recent CeVD or MI, recent/planned revascularisation, heart failure, aortic stenosis, valvular heart disease, atrial fibrillation/flutter, serious arrhythmia, renal/liver dysfunction

VALUE⁵⁵	Drug classes comparison	Multi-country	67 (8)	4.2	CCB-based (7596)	ARB-based (7649)	9169/6076	MI, Stroke, HF, CVD death	1.6	Age ≥50 years, hypertension, CVD, CVD risk factors (male sex, age >50 years, diabetes, current smoking, high cholesterol, LVH, proteinuria, serum creatinine 150 to 265 µmol/l)	Renal artery stenosis, recent CAD or CeVD, severe hepatic disease or chronic renal failure, heart failure, on monotherapy with β-blocker for CAD and hypertension
VHAS⁵⁶	Drug classes comparison	Italy	54 (7)	1.7	Diuretic (707)	CCB (707)	0/1249	MI or IHD, Stroke, HF, CVD death	1.7	Age 40-65 years, BP ≥160/95 mmHg	Secondary hypertension, recent stroke or TIA, CAD, PAD, bradycardia, arrhythmias, heart failure, renal or hepatic dysfunction, hyperuricaemia, hypokalaemia, T1D, familial dyslipidemia, serious concomitant disease

CVD: Cardiovascular disease; MI: myocardial infarction; IHD: ischaemic heart disease; HF: heart failure; SD: Standard deviation; ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

Table S2. Risk of bias assessment of each trial.

Trial	Risk of bias arising from randomisation	Risk of bias due to effect of assignment to intervention	Risk of bias due to missing outcome data	Risk of bias due to measurement of outcome	Risk of bias due to reporting of result	Overall risk of bias
AASK	Low	Low	Low	Low	Low	Low
ABCD	Low	Low	Low	Low	Low	Low
ACCORD	Low	Some	Low	Low	Low	Low
ACTIVE I	Low	Low	Low	Low	Low	Low
ADVANCE	Low	Low	Low	Low	Low	Low
ALLHAT	Low	Low	Low	Low	Low	Low
ANBP	Low	Low	Low	Low	Low	Low
ANBP2	Low	Some	Low	Low	Low	Low
ASCOT-BPLA	Low	Some	Low	Low	Low	Low
CAMELOT	Low	Low	Low	Low	Low	Low
CAPPP	Low	Some	Low	Low	Low	Some
CARDIO-SIS	Low	Some	Some	Low	Low	Some
CASE-J	Low	Some	Low	Low	Low	Low
COLM	Low	Some	Low	Low	Low	Low
CONVINCE	Low	Low	Low	Low	Low	Low
COPE	Low	Some	Low	Low	Low	Low
DIABHYCAR	Low	Low	Low	Low	Low	Low
Dutch TIA Trial	Low	Low	Low	Low	Low	Low
ELSA	Low	Low	Low	Low	Low	Low
EUROPA	Low	Low	Low	Low	Low	Low
EWPHE	Low	Some	Low	Low	Low	Some
HII-CREATE	Low	Some	Low	Low	Low	Low
HOMED-BP	Low	Some	Low	Low	Low	Low
HOPE	Low	Some	Low	Low	Low	Low
HYVET	Low	Low	Low	Low	Low	Low
INSIGHT	Low	Low	Low	Low	Low	Low
INVEST	Low	Some	Low	Low	Low	Low
JMIC-B	Low	Some	Low	Low	Low	Low
LIFE	Low	Low	Low	Low	Low	Low
MOSES	Low	Some	Low	Low	Low	Low
NICS-EH	Low	Some	Low	Low	Low	Some
NORDIL	Low	Some	Low	Low	Low	Low
ONTARGET	Low	Some	Low	Low	Low	Low
PART 2	Low	Low	Low	Low	Low	Low
PEACE	Low	Low	Low	Low	Low	Low
PREVEND IT	Low	Low	Low	Low	Low	Low
PREVENT	Low	Low	Low	Low	Low	Low
PROFESS	Low	Low	Low	Low	Low	Low
PROGRESS	Low	Low	Low	Low	Low	Low
SHEP	Low	Low	Low	Low	Low	Low
SPRINT	Low	Some	Low	Low	Low	Low
STOP	Low	Some	Low	Low	Low	Low
HYPERTENSION-2	Low	Some	Low	Low	Low	Low
SYST-EUR	Low	Some	Low	Low	Low	Low
TRANSCEND	Low	Low	Low	Low	Low	Low
UKPDS	Low	Some	Low	Low	Low	Low
VALISH	Low	Low	Low	Low	Low	Low
VALUE	Low	Low	Low	Low	Low	Low
VHAS	Low	Low	Low	Low	Low	Low

Trial name acronyms are described in full in the Trial acronym legend in the Supplement.

Table S3. Prevalence of comorbidity by cardiovascular disease status and systolic blood pressure at baseline.

Comorbidity	No previous cardiovascular disease at baseline							Previous cardiovascular disease at baseline						
	Baseline systolic blood pressure							Baseline systolic blood pressure						
	<120	120-129	130-139	140-149	150-159	160-169	≥170	<120	120-129	130-139	140-149	150-159	160-169	≥170
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Peripheral vascular disease	78 (7.6)	188 (9.9)	332 (9.7)	590 (7.2)	645 (6.3)	825 (5.3)	1275 (5.9)	640 (13.3)	1063 (13.2)	1484 (13.0)	1731 (11.9)	1466 (11.9)	1259 (12.2)	1314 (11.9)
Atrial fibrillation	465 (9.7)	866 (8.5)	1077 (5.7)	1117 (3.6)	765 (2.4)	608 (1.6)	905 (1.8)	451 (3.8)	753 (3.9)	937 (3.4)	927 (2.9)	713 (2.7)	446 (2.2)	449 (2.3)
Diabetes	2163 (45.1)	4255 (42.0)	7747 (40.9)	11514 (36.8)	10485 (32.9)	9214 (23.7)	9812 (19.3)	2691 (25.4)	4310 (25.6)	6825 (27.7)	8485 (28.7)	7219 (28.6)	5113 (26.5)	5063 (26.2)
Chronic kidney disease	501 (40.0)	569 (23.4)	1205 (19.7)	2847 (21.5)	2926 (19.3)	3537 (17.3)	4574 (17.6)	134 (4.4)	214 (3.8)	472 (5.7)	1135 (9.5)	1156 (11.3)	1307 (14.6)	1673 (18.8)
Cerebrovascular disease	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2326 (22.8)	5445 (31.8)	8468 (34.6)	10437 (36.3)	8991 (37.5)	7339 (40.2)	7390 (41.1)
Ischaemic heart disease	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	10264 (86.7)	15328 (79.0)	21144 (76.8)	24286 (75.4)	19989 (74.7)	14464 (71.7)	13851 (70.4)
Heart failure	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

n: number of participants

Table S4. Leave-one-out sensitivity analysis per 5 mmHg systolic blood pressure reduction for the effects of blood pressure-lowering treatment on primary and secondary outcomes and systolic blood pressure at baseline.

Baseline systolic blood pressure	Trial excluded from analysis															
	AASK	ABCD	ACCORD	ACTIVE I	ADVANCE	ALLHAT	ANBP	ANBP2	ASCOT-BPLA	CAMELOT	CAPP	CARDIO-SIS	CASE-J	COLM	CONVINCE	COPE
Major cardiovascular events																
<120	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	0.79 (0.71 to 0.89)	0.78 (0.71 to 0.86)	0.77 (0.67 to 0.85)	0.78 (0.70 to 0.86)	0.79 (0.72 to 0.87)									
120 to 129	0.91 (0.85 to 0.98)	0.91 (0.85 to 0.98)	0.91 (0.84 to 0.98)	0.92 (0.85 to 0.99)	0.90 (0.83 to 0.97)	0.91 (0.84 to 0.98)	0.91 (0.85 to 0.98)	0.91 (0.85 to 0.98)	0.92 (0.85 to 0.99)	0.91 (0.85 to 0.98)	0.92 (0.85 to 0.99)	0.91 (0.85 to 0.98)				
130 to 139	0.94 (0.89 to 1.00)	0.94 (0.89 to 0.99)	0.91 (0.85 to 0.97)	0.93 (0.88 to 0.97)	0.93 (0.88 to 0.98)	0.97 (0.91 to 1.03)	0.94 (0.89 to 0.99)	0.94 (0.89 to 0.99)	0.94 (0.89 to 1.00)	0.94 (0.89 to 0.99)						
140 to 149	0.92 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.90 (0.85 to 0.96)	0.93 (0.88 to 0.98)	0.94 (0.89 to 0.99)	0.91 (0.86 to 0.96)	0.93 (0.88 to 0.98)	0.94 (0.89 to 0.99)	0.93 (0.88 to 0.98)	0.94 (0.89 to 0.98)	0.93 (0.88 to 0.98)					
150 to 159	0.88 (0.83 to 0.93)	0.88 (0.83 to 0.94)	0.89 (0.83 to 0.95)	0.89 (0.83 to 0.94)	0.87 (0.83 to 0.92)	0.88 (0.83 to 0.94)	0.89 (0.84 to 0.94)	0.89 (0.83 to 0.94)	0.89 (0.83 to 0.94)							
160 to 169	0.87 (0.82 to 0.92)	0.87 (0.82 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.82 to 0.91)	0.86 (0.82 to 0.92)	0.87 (0.82 to 0.92)	0.89 (0.85 to 0.94)	0.87 (0.83 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.82 to 0.91)	0.87 (0.83 to 0.92)				
≥170	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.91 (0.87 to 0.95)	0.90 (0.86 to 0.95)	0.90 (0.86 to 0.94)											
<i>p for interaction</i>	P adjusted=0.35	P adjusted=0.35	P adjusted=0.77	P adjusted=0.28	P adjusted=0.14	P adjusted=0.14	P adjusted=0.28	P adjusted=0.27	P adjusted=0.28	P adjusted=0.35	P adjusted=0.35	P adjusted=0.35	P adjusted=0.35	P adjusted=0.28	P adjusted=0.28	
	P unadjusted=0.05	P unadjusted=0.05	P unadjusted=0.11	P unadjusted=0.04	P unadjusted=0.02	P unadjusted=0.04	P unadjusted=0.03	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.04						
Stroke																
<120	0.81 (0.66 to 1.00)	0.79 (0.64 to 0.96)	0.83 (0.67 to 1.03)	0.77 (0.63 to 0.95)	0.75 (0.60 to 0.92)	0.79 (0.64 to 0.96)	0.79 (0.65 to 0.97)	0.80 (0.65 to 0.97)	0.80 (0.66 to 0.98)	0.80 (0.65 to 0.98)	0.80 (0.65 to 0.97)	0.80 (0.65 to 0.97)	0.79 (0.65 to 0.97)	0.79 (0.65 to 0.97)	0.79 (0.65 to 0.97)	
120 to 129	0.87 (0.76 to 1.01)	0.86 (0.74 to 0.99)	0.86 (0.74 to 0.99)	0.88 (0.76 to 1.01)	0.85 (0.73 to 0.98)	0.86 (0.74 to 0.99)										
130 to 139	0.92 (0.83 to 1.03)	0.93 (0.84 to 1.03)	0.94 (0.84 to 1.05)	0.91 (0.81 to 1.02)	0.92 (0.82 to 1.02)	0.93 (0.84 to 1.03)	0.92 (0.83 to 1.02)	0.92 (0.83 to 1.03)	0.93 (0.83 to 1.03)	0.93 (0.83 to 1.03)						
140 to 149	0.90 (0.82 to 0.99)	0.90 (0.82 to 1.00)	0.89 (0.81 to 0.99)	0.89 (0.81 to 0.99)	0.90 (0.81 to 1.00)	0.90 (0.82 to 1.00)	0.90 (0.82 to 0.99)	0.90 (0.82 to 1.00)								
150 to 159	0.77 (0.69 to 0.85)	0.78 (0.70 to 0.87)	0.77 (0.69 to 0.86)	0.77 (0.68 to 0.84)	0.78 (0.70 to 0.87)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.78 (0.70 to 0.86)	0.78 (0.70 to 0.86)	0.78 (0.70 to 0.86)	0.77 (0.70 to 0.86)				
160 to 169	0.86 (0.78 to 0.93)	0.87 (0.79 to 0.94)	0.87 (0.79 to 0.94)	0.87 (0.79 to 0.94)	0.86 (0.79 to 0.94)											
≥170	0.90 (0.84 to 0.97)	0.91 (0.85 to 0.97)	0.91 (0.85 to 0.97)	0.91 (0.85 to 0.97)	0.90 (0.84 to 0.97)	0.90 (0.84 to 0.97)	0.91 (0.85 to 0.97)	0.90 (0.84 to 0.97)								
<i>p for interaction</i>	P adjusted=0.70	P adjusted=0.77	P adjusted=0.63	P adjusted=0.42	P adjusted=0.42	P adjusted=0.70	P adjusted=0.49	P adjusted=0.49	P adjusted=0.84	P adjusted=0.91	P adjusted=0.77	P adjusted=0.70	P adjusted=0.70	P adjusted=0.70	P adjusted=0.77	
	P unadjusted=0.10	P unadjusted=0.11	P unadjusted=0.11	P unadjusted=0.09	P unadjusted=0.06	P unadjusted=0.10	P unadjusted=0.07	P unadjusted=0.07	P unadjusted=0.12	P unadjusted=0.13	P unadjusted=0.11	P unadjusted=0.10	P unadjusted=0.10	P unadjusted=0.10	P unadjusted=0.11	P unadjusted=0.11
Ischaemic heart disease																
<120	0.84 (0.73 to 0.96)	0.84 (0.73 to 0.96)	0.87 (0.73 to 1.04)	0.83 (0.73 to 0.96)	0.81 (0.70 to 0.93)	0.78 (0.66 to 0.90)	0.83 (0.73 to 0.96)	0.84 (0.73 to 0.96)	0.83 (0.73 to 0.96)							
120 to 129	0.95 (0.85 to 1.05)	0.95 (0.86 to 1.06)	0.94 (0.83 to 1.06)	0.95 (0.85 to 1.05)	0.94 (0.85 to 1.05)	0.93 (0.82 to 1.05)	0.95 (0.86 to 1.06)	0.95 (0.86 to 1.06)	0.96 (0.86 to 1.06)	0.95 (0.86 to 1.05)						
130 to 139	0.97 (0.89 to 1.05)	0.96 (0.88 to 1.04)	0.90 (0.82 to 1.03)	0.96 (0.88 to 1.05)	0.97 (0.90 to 1.06)	0.96 (0.87 to 1.06)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	
140 to 149	0.94 (0.87 to 1.01)	0.94 (0.87 to 1.01)	0.90 (0.82 to 1.01)	0.94 (0.87 to 1.02)	0.95 (0.88 to 1.03)	0.94 (0.87 to 1.02)	0.95 (0.88 to 1.02)	0.94 (0.87 to 1.02)	0.95 (0.88 to 1.02)	0.94 (0.87 to 1.02)						
150 to 159	0.90 (0.83 to 0.98)	0.91 (0.83 to 0.99)	0.91 (0.83 to 1.00)	0.90 (0.83 to 0.98)	0.91 (0.83 to 0.99)	0.91 (0.83 to 1.00)	0.91 (0.83 to 0.99)									
160 to 169	0.87 (0.80 to 0.95)	0.87 (0.80 to 0.94)	0.87 (

Table S4: Continues

Baseline systolic blood pressure	Trial excluded from analysis																
	DIABHYCAR	Dutch TIA	ELSA	EUROPA	EWPHE	HJ-CREATE	HOMED-BP	HOPE	HYVET	INSIGHT	INVEST	JMIC-B	LIFE	MOSES	NICS-EH	NORDIL	
Major cardiovascular events	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI		
<120	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	0.80 (0.72 to 0.88)	0.79 (0.72 to 0.87)												
120 to 129	0.91 (0.85 to 0.98)	0.91 (0.85 to 0.98)	0.91 (0.85 to 0.98)	0.92 (0.85 to 0.99)	0.91 (0.85 to 0.98)	0.91 (0.85 to 0.98)	0.92 (0.86 to 0.99)	0.91 (0.85 to 0.98)	0.91 (0.84 to 0.98)	0.91 (0.85 to 0.98)							
130 to 139	0.94 (0.89 to 0.99)	0.94 (0.89 to 0.99)	0.94 (0.89 to 0.99)	0.95 (0.90 to 1.01)	0.94 (0.89 to 0.99)	0.94 (0.89 to 0.99)	0.94 (0.89 to 1.00)	0.95 (0.89 to 1.00)	0.94 (0.89 to 0.99)	0.94 (0.89 to 1.00)	0.94 (0.89 to 0.99)						
140 to 149	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.94 (0.89 to 0.99)	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.94 (0.89 to 0.99)	0.93 (0.88 to 0.98)								
150 to 159	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.89 (0.84 to 0.94)	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.89 (0.84 to 0.94)	0.88 (0.83 to 0.94)									
160 to 169	0.87 (0.82 to 0.92)	0.87 (0.82 to 0.92)	0.87 (0.82 to 0.92)	0.87 (0.83 to 0.92)	0.88 (0.83 to 0.93)	0.87 (0.83 to 0.92)	0.88 (0.83 to 0.92)	0.87 (0.82 to 0.92)									
≥170	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.91 (0.87 to 0.95)	0.90 (0.86 to 0.94)								
<i>p for interaction</i>	P adjusted=0.35	P adjusted=0.28	P adjusted=0.35	P adjusted=0.35	P adjusted=0.42	P adjusted=0.35	P adjusted=0.42	P adjusted=0.28	P adjusted=0.42	P adjusted=0.42	P adjusted=0.56	P adjusted=0.35	P adjusted=0.28	P adjusted=0.28	P adjusted=0.28		
	P unadjusted=0.05	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.06	P unadjusted=0.05	P unadjusted=0.04	P unadjusted=0.06	P unadjusted=0.06	P unadjusted=0.08	P unadjusted=0.05	P unadjusted=0.04	P unadjusted=0.04	P unadjusted=0.04	P unadjusted=0.04	
Stroke	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI		
<120	0.79 (0.65 to 0.97)	0.79 (0.65 to 0.97)	0.79 (0.65 to 0.97)	0.80 (0.65 to 0.98)	0.79 (0.65 to 0.97)	0.79 (0.65 to 0.97)	0.79 (0.65 to 0.97)	0.83 (0.68 to 1.02)	0.79 (0.65 to 0.97)								
120 to 129	0.86 (0.75 to 0.99)	0.86 (0.75 to 1.00)	0.86 (0.74 to 0.99)	0.86 (0.74 to 1.00)	0.86 (0.74 to 0.99)	0.86 (0.74 to 0.99)	0.85 (0.74 to 0.98)	0.86 (0.74 to 0.99)									
130 to 139	0.92 (0.83 to 1.03)	0.93 (0.83 to 1.03)	0.92 (0.83 to 1.03)	0.92 (0.83 to 1.03)	0.93 (0.83 to 1.03)	0.93 (0.83 to 1.03)	0.94 (0.84 to 1.04)	0.92 (0.83 to 1.03)	0.93 (0.84 to 1.03)	0.92 (0.83 to 1.03)	0.93 (0.83 to 1.03)						
140 to 149	0.90 (0.81 to 0.99)	0.90 (0.82 to 0.99)	0.90 (0.81 to 1.00)	0.90 (0.82 to 0.99)													
150 to 159	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	
160 to 169	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)	
≥170	0.90 (0.84 to 0.97)	0.91 (0.84 to 0.97)	0.91 (0.84 to 0.97)	0.90 (0.84 to 0.97)													
<i>p for interaction</i>	P adjusted=0.77	P adjusted=0.70	P adjusted=0.77	P adjusted=0.91	P adjusted=0.70	P adjusted=0.98	P adjusted=0.70	P adjusted=0.77	P adjusted=0.63	P adjusted=0.63	P adjusted=0.63	P adjusted=0.77	P adjusted=0.35	P adjusted=0.77	P adjusted=0.77	P adjusted=1.00	
	P unadjusted=0.11	P unadjusted=0.10	P unadjusted=0.13	P unadjusted=0.10	P unadjusted=0.10	P unadjusted=0.14	P unadjusted=0.10	P unadjusted=0.11	P unadjusted=0.09	P unadjusted=0.09	P unadjusted=0.11	P unadjusted=0.15	P unadjusted=0.15				
Ischaemic heart disease	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI	HR 95%CI		
<120	0.83 (0.73 to 0.96)	0.83 (0.73 to 0.96)	0.83 (0.73 to 0.96)	0.85 (0.73 to 0.98)	0.83 (0.73 to 0.96)												
120 to 129	0.95 (0.86 to 1.05)	0.95 (0.86 to 1.05)	0.95 (0.86 to 1.05)	0.97 (0.87 to 1.07)	0.95 (0.86 to 1.05)												
130 to 139	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.97 (0.89 to 1.05)										
140 to 149																	

Table S4: Continues

Baseline systolic blood pressure	Trial excluded from analysis															
	ONTARGET	PART 2	PEACE	PREVEND IT	PREVENT	PROFESS	PROGRESS	SHEP	SPRINT	STOP HYPERTENSION-2	SYST-EUR	TRANSCEND	UKPDS	VALISH	VALUE	VHAS
Major cardiovascular events																
<120	0.80 (0.72 to 0.88)	0.78 (0.71 to 0.86)	0.79 (0.72 to 0.88)	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.88)	0.78 (0.71 to 0.86)	0.79 (0.72 to 0.87)	0.81 (0.73 to 0.90)	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	0.79 (0.71 to 0.87)	0.79 (0.72 to 0.87)	0.79 (0.72 to 0.87)	
120 to 129	0.90 (0.84 to 0.97)	0.91 (0.85 to 0.98)	0.92 (0.85 to 0.99)	0.91 (0.85 to 0.98)	0.91 (0.85 to 0.98)	0.92 (0.86 to 0.99)	0.92 (0.85 to 0.99)	0.91 (0.84 to 0.98)	0.91 (0.85 to 0.98)	0.91 (0.84 to 0.97)	0.91 (0.85 to 0.98)					
130 to 139	0.93 (0.88 to 0.99)	0.94 (0.89 to 0.99)	0.94 (0.89 to 1.00)	0.94 (0.89 to 1.00)	0.94 (0.89 to 1.00)	0.93 (0.88 to 0.98)	0.94 (0.86 to 0.99)	0.94 (0.89 to 0.99)	0.97 (0.91 to 1.03)	0.94 (0.89 to 0.99)	0.94 (0.89 to 1.00)	0.94 (0.89 to 1.00)	0.94 (0.88 to 0.99)	0.94 (0.88 to 0.99)	0.94 (0.88 to 0.99)	
140 to 149	0.92 (0.87 to 0.97)	0.93 (0.88 to 0.98)	0.92 (0.87 to 0.97)	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.93 (0.89 to 0.98)	0.94 (0.89 to 1.00)	0.93 (0.88 to 0.98)	0.91 (0.86 to 0.97)	0.93 (0.88 to 0.98)	0.92 (0.88 to 0.98)	0.94 (0.87 to 0.99)	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)	0.94 (0.88 to 0.99)	
150 to 159	0.89 (0.84 to 0.95)	0.89 (0.84 to 0.94)	0.89 (0.83 to 0.94)	0.89 (0.83 to 0.94)	0.89 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.89 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.89 (0.84 to 0.94)	0.87 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	0.88 (0.83 to 0.94)	
160 to 169	0.87 (0.82 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.83 to 0.92)	0.86 (0.82 to 0.91)	0.89 (0.84 to 0.94)	0.85 (0.80 to 0.90)	0.87 (0.82 to 0.92)	0.87 (0.83 to 0.92)	0.88 (0.83 to 0.92)	0.87 (0.82 to 0.92)	0.87 (0.82 to 0.92)	0.87 (0.83 to 0.92)	0.87 (0.83 to 0.92)	
≥170	0.90 (0.86 to 0.94)	0.90 (0.86 to 0.94)	0.90 (0.87 to 0.95)	0.90 (0.87 to 0.94)	0.90 (0.87 to 0.94)	0.91 (0.87 to 0.95)	0.89 (0.85 to 0.93)	0.90 (0.86 to 0.94)	0.89 (0.85 to 0.94)	0.90 (0.86 to 0.95)	0.90 (0.86 to 0.95)	0.90 (0.86 to 0.94)	0.90 (0.87 to 0.95)	0.90 (0.87 to 0.95)	0.90 (0.86 to 0.94)	
p for interaction	P adjusted=1.00	P adjusted=0.28	P adjusted=0.70	P adjusted=0.35	P adjusted=0.35	P adjusted=0.42	P adjusted=0.28	P adjusted=0.28	P adjusted=0.42	P adjusted=0.28	P adjusted=0.35	P adjusted=0.42	P adjusted=0.28	P adjusted=0.35	P adjusted=0.28	
	P unadjusted=0.20	P unadjusted=0.04	P unadjusted=0.10	P unadjusted=0.05	P unadjusted=0.05	P unadjusted=0.06	P unadjusted=0.04	P unadjusted=0.04	P unadjusted=0.06	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.06	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.04	P unadjusted=0.05
Stroke																
<120	0.80 (0.64 to 0.98)	0.79 (0.64 to 0.97)	0.80 (0.65 to 0.98)	0.80 (0.65 to 0.97)	0.80 (0.64 to 0.98)	0.77 (0.62 to 0.95)	0.79 (0.65 to 0.97)	0.81 (0.65 to 1.00)	0.79 (0.65 to 0.97)	0.78 (0.64 to 0.96)	0.79 (0.65 to 0.97)	0.79 (0.64 to 0.96)	0.79 (0.64 to 0.97)	0.79 (0.64 to 0.96)	0.79 (0.65 to 0.97)	
120 to 129	0.85 (0.74 to 0.99)	0.86 (0.74 to 0.99)	0.87 (0.75 to 1.00)	0.86 (0.75 to 0.99)	0.85 (0.74 to 0.98)	0.84 (0.72 to 0.99)	0.87 (0.74 to 1.03)	0.86 (0.74 to 0.99)	0.82 (0.71 to 0.96)	0.86 (0.73 to 0.98)	0.86 (0.74 to 0.99)	0.86 (0.75 to 1.00)	0.86 (0.74 to 0.99)	0.86 (0.75 to 1.00)	0.86 (0.74 to 0.99)	
130 to 139	0.91 (0.82 to 1.01)	0.92 (0.83 to 1.02)	0.93 (0.84 to 1.03)	0.93 (0.83 to 1.03)	0.92 (0.83 to 1.02)	0.88 (0.78 to 0.99)	0.90 (0.80 to 1.01)	0.92 (0.83 to 1.02)	0.93 (0.83 to 1.04)	0.92 (0.83 to 1.02)	0.92 (0.83 to 1.03)	0.94 (0.84 to 1.05)	0.94 (0.84 to 1.04)	0.92 (0.83 to 1.02)	0.92 (0.83 to 1.03)	
140 to 149	0.90 (0.81 to 0.99)	0.90 (0.82 to 1.00)	0.90 (0.81 to 0.99)	0.90 (0.82 to 0.99)	0.90 (0.82 to 0.99)	0.91 (0.82 to 1.01)	0.90 (0.82 to 0.99)	0.92 (0.82 to 1.03)	0.90 (0.82 to 0.99)	0.91 (0.82 to 1.00)	0.90 (0.82 to 0.99)	0.90 (0.82 to 0.99)				
150 to 159	0.79 (0.71 to 0.88)	0.77 (0.70 to 0.86)	0.78 (0.70 to 0.87)	0.78 (0.70 to 0.86)	0.78 (0.70 to 0.87)	0.78 (0.70 to 0.87)	0.77 (0.68 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.68 to 0.85)	0.77 (0.70 to 0.86)	0.76 (0.68 to 0.85)	0.78 (0.70 to 0.87)	0.78 (0.70 to 0.86)	0.77 (0.70 to 0.86)	0.77 (0.70 to 0.86)	
160 to 169	0.85 (0.78 to 0.93)	0.86 (0.79 to 0.94)	0.85 (0.78 to 0.93)	0.90 (0.82 to 0.99)	0.86 (0.79 to 0.95)	0.87 (0.80 to 0.95)	0.87 (0.80 to 0.95)	0.87 (0.80 to 0.95)	0.86 (0.80 to 0.94)	0.87 (0.79 to 0.94)	0.86 (0.79 to 0.94)	0.86 (0.79 to 0.94)				
≥170	0.90 (0.84 to 0.96)	0.90 (0.84 to 0.97)	0.91 (0.85 to 0.97)	0.89 (0.85 to 0.97)	0.90 (0.84 to 0.97)	0.91 (0.85 to 0.97)	0.89 (0.85 to 0.95)	0.91 (0.85 to 0.97)								
p for interaction	P adjusted=1.00	P adjusted=0.70	P adjusted=0.35	P adjusted=0.35	P adjusted=0.42	P adjusted=0.28	P adjusted=0.28	P adjusted=0.42	P adjusted=0.42	P adjusted=0.28	P adjusted=0.35	P adjusted=0.42	P adjusted=0.28	P adjusted=0.35	P adjusted=0.28	
	P unadjusted=0.20	P unadjusted=0.04	P unadjusted=0.10	P unadjusted=0.05	P unadjusted=0.05	P unadjusted=0.06	P unadjusted=0.04	P unadjusted=0.04	P unadjusted=0.06	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.06	P unadjusted=0.04	P unadjusted=0.05	P unadjusted=0.04	P unadjusted=0.05
Ischaemic heart disease																
<120	0.86 (0.75 to 0.99)	0.82 (0.72 to 0.94)	0.86 (0.75 to 0.99)	0.83 (0.73 to 0.96)	0.83 (0.72 to 0.95)	0.83 (0.73 to 0.96)	0.82 (0.72 to 0.95)	0.83 (0.73 to 0.96)	0.84 (0.73 to 0.98)	0.83 (0.73 to 0.96)	0.85 (0.74 to 0.97)	0.83 (0.73 to 0.97)	0.83 (0.73 to 0.96)	0.83 (0.72 to 0.95)	0.83 (0.73 to 0.96)	
120 to 129	0.95 (0.86 to 1.06)	0.95 (0.86 to 1.06)	0.95 (0.86 to 1.06)	0.95 (0.86 to 1.05)	0.95 (0.86 to 1.05)	0.95 (0.86 to 1.05)	0.96 (0.87 to 1.05)	0.95 (0.86 to 1.05)	0.94 (0.85 to 1.05)	0.95 (0.86 to 1.05)						
130 to 139	0.96 (0.89 to 1.04)	0.97 (0.89 to 1.05)	0.96 (0.89 to 1.04)	0.96 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.98 (0.90 to 1.05)	0.96 (0.89 to 1.05)	0.97 (0.90 to 1.08)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.97 (0.89 to 1.05)	0.96 (0.89 to 1.05)	0.96 (0.89 to 1.05)	
140 to 149	0.93 (0.86 to 1.00)	0.94 (0.87 to 1.02)	0.94 (0.87 to 1.01)	0.94 (0.87 to 1.02)	0.94 (0.87 to 1.01)	0.94 (0.87 to 1.01)	0.94 (0.87 to 1.02)	0.94 (0.87 to 1.02)	0.95 (0.88 to 1.03)	0.94 (0.87 to 1.02)	0.94 (0.87 to 1.02)	0.94 (0.87 to 1.02)	0.95 (0.88 to 1.03)	0.94 (0.87 to 1.02)	0.94 (0.87 to 1.02)	
150 to 159	0.90 (0.83 to 0.98)	0.91 (0.84 to 0.99)	0.90 (0.83 to 0.98)	0.91 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.90 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.90 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.90 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.91 (0.83 to 0.99)	0.91 (0.83 to 0.99)	
160 to 169	0.87 (0.80 to 0.94)	0.87 (0.80 to 0.95)	0.87 (0.80 to 0.94)	0.87 (0.80 to 0.95)	0.87											

Figure S1. Kaplan–Meier rates of stroke per 5 mmHg reduction in systolic blood pressure, stratified by treatment allocation and cardiovascular disease status at baseline.

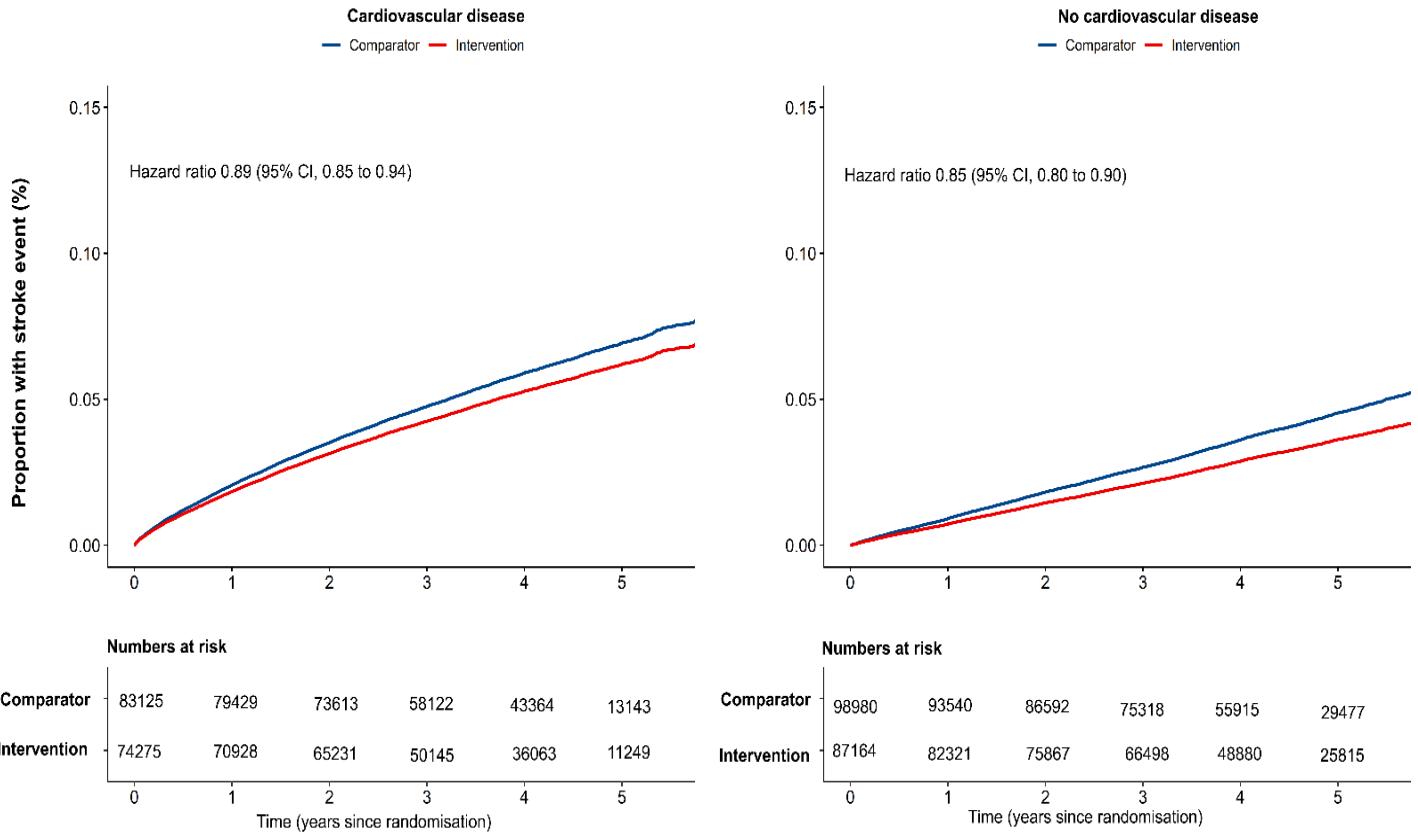


Figure S2. Kaplan–Meier rates of ischaemic heart disease per 5 mmHg reduction in systolic blood pressure, stratified by treatment allocation and cardiovascular disease status at baseline.

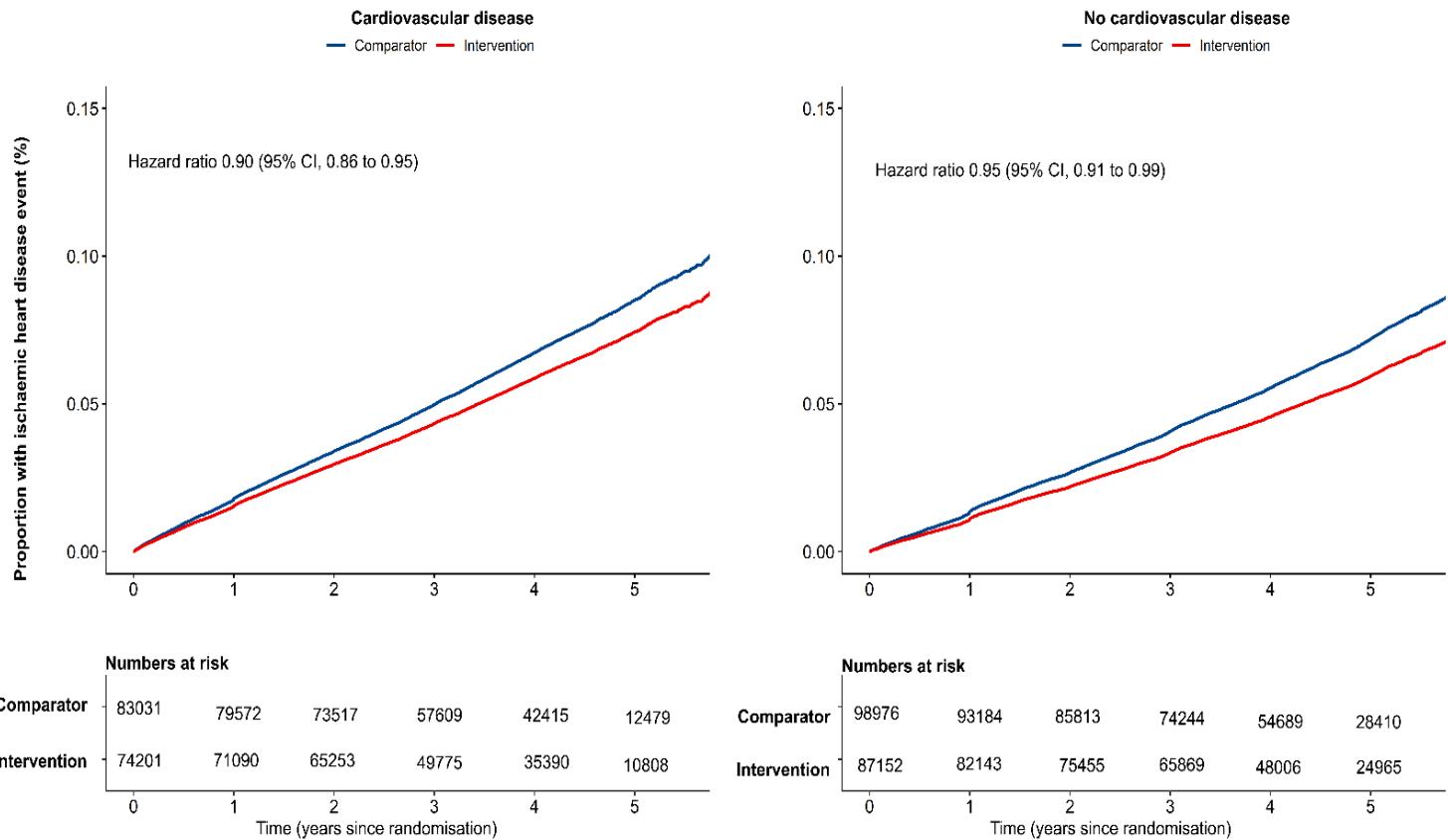


Figure S3. Kaplan–Meier rates of heart failure per 5 mmHg reduction in systolic blood pressure, stratified by treatment allocation and cardiovascular disease status at baseline.

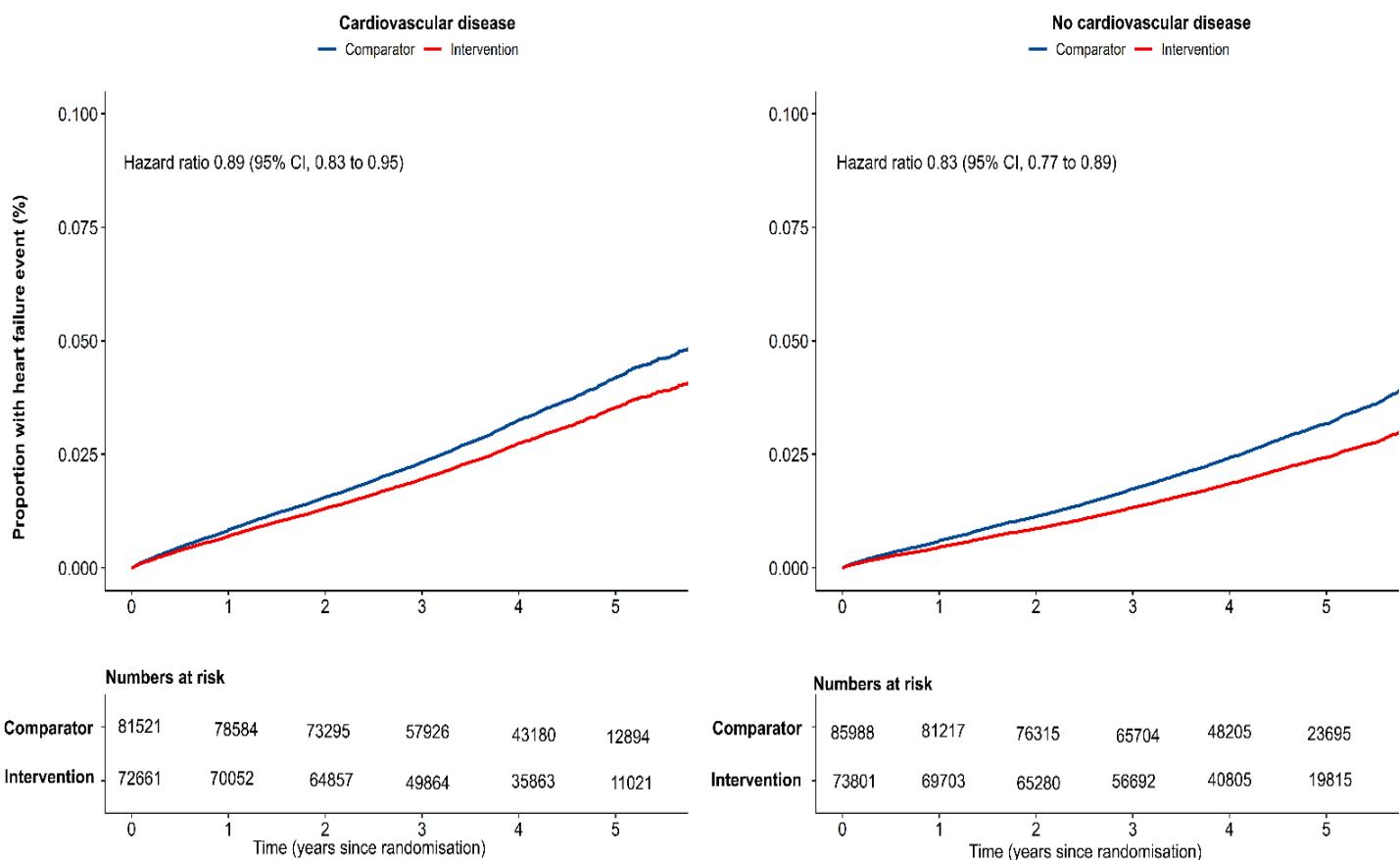


Figure S4. Kaplan–Meier rates of cardiovascular death per 5 mmHg reduction in systolic blood pressure, stratified by treatment allocation and cardiovascular disease status at baseline.

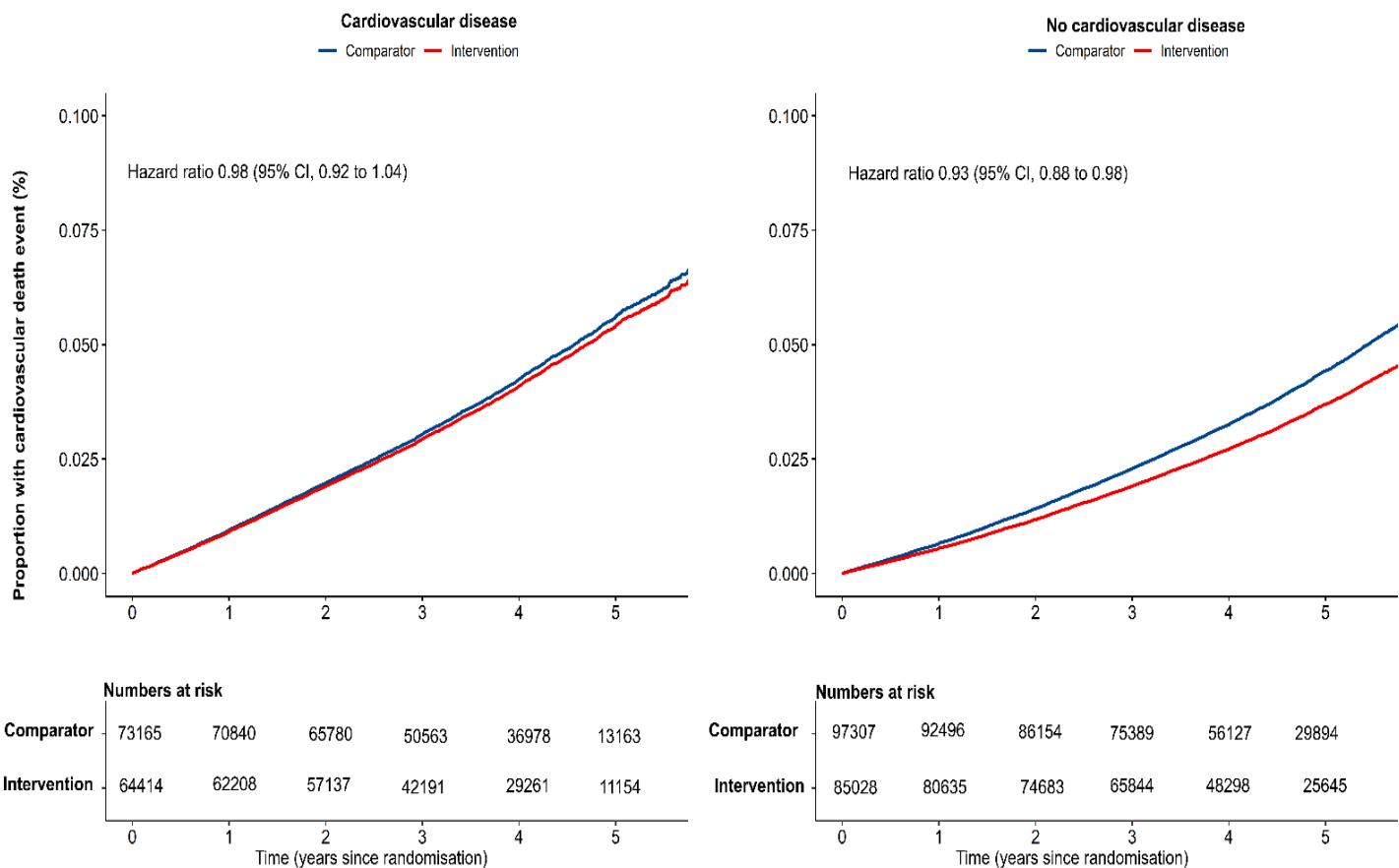


Figure S5. Kaplan–Meier rates of all-cause death per 5 mmHg reduction in systolic blood pressure, stratified by treatment allocation and cardiovascular disease status at baseline.

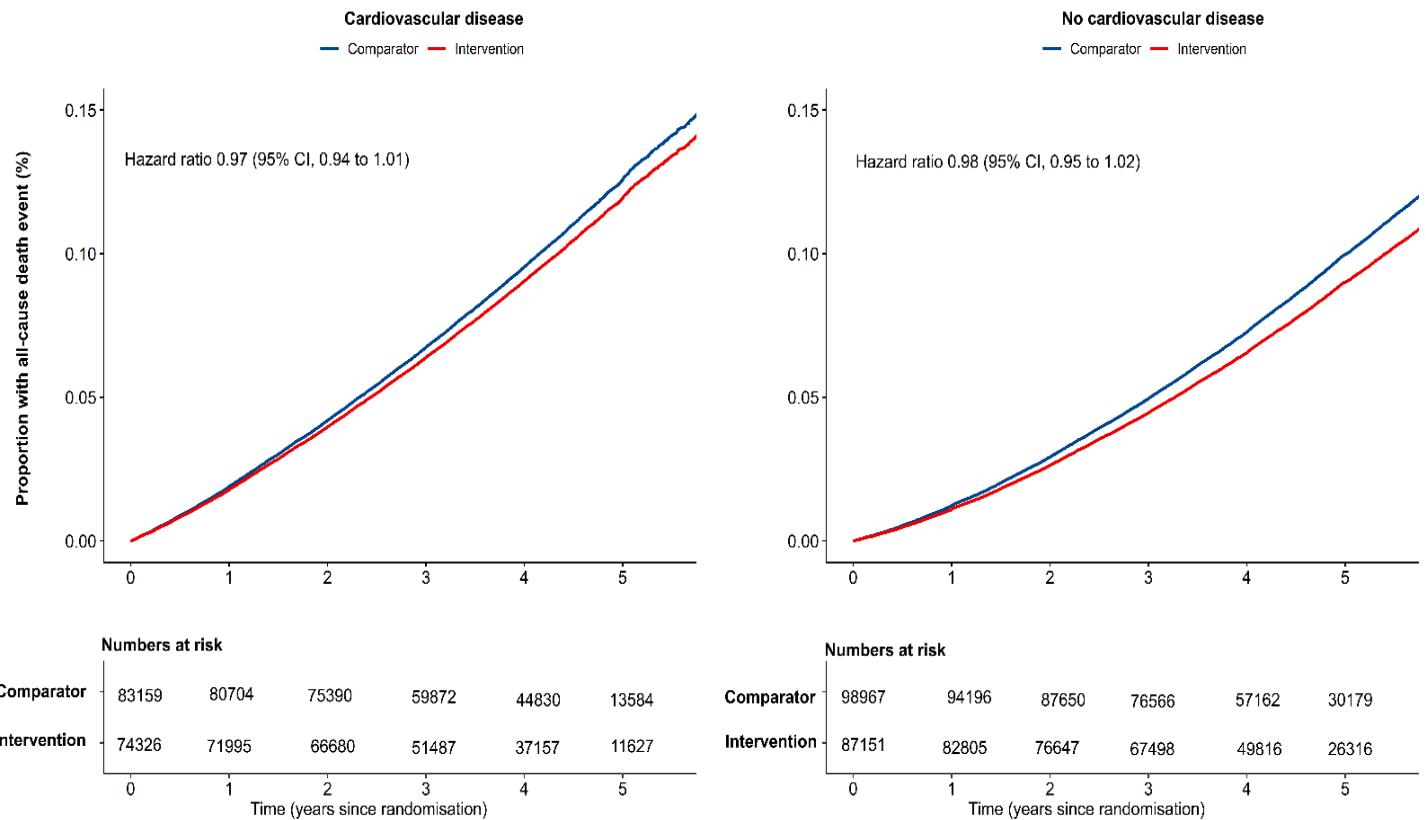


Figure S6. Effects of blood pressure-lowering treatment on primary and secondary outcomes by systolic blood pressure at baseline.

Forest plot shows the hazard ratios (HR) and 95% confidence intervals (CI) per 5 mmHg systolic blood pressure reduction, separately for each outcome; p for interaction-adj: Adjusted for multiple testing using Hommel's method; p for interaction-unadj: unadjusted for multiple testing.

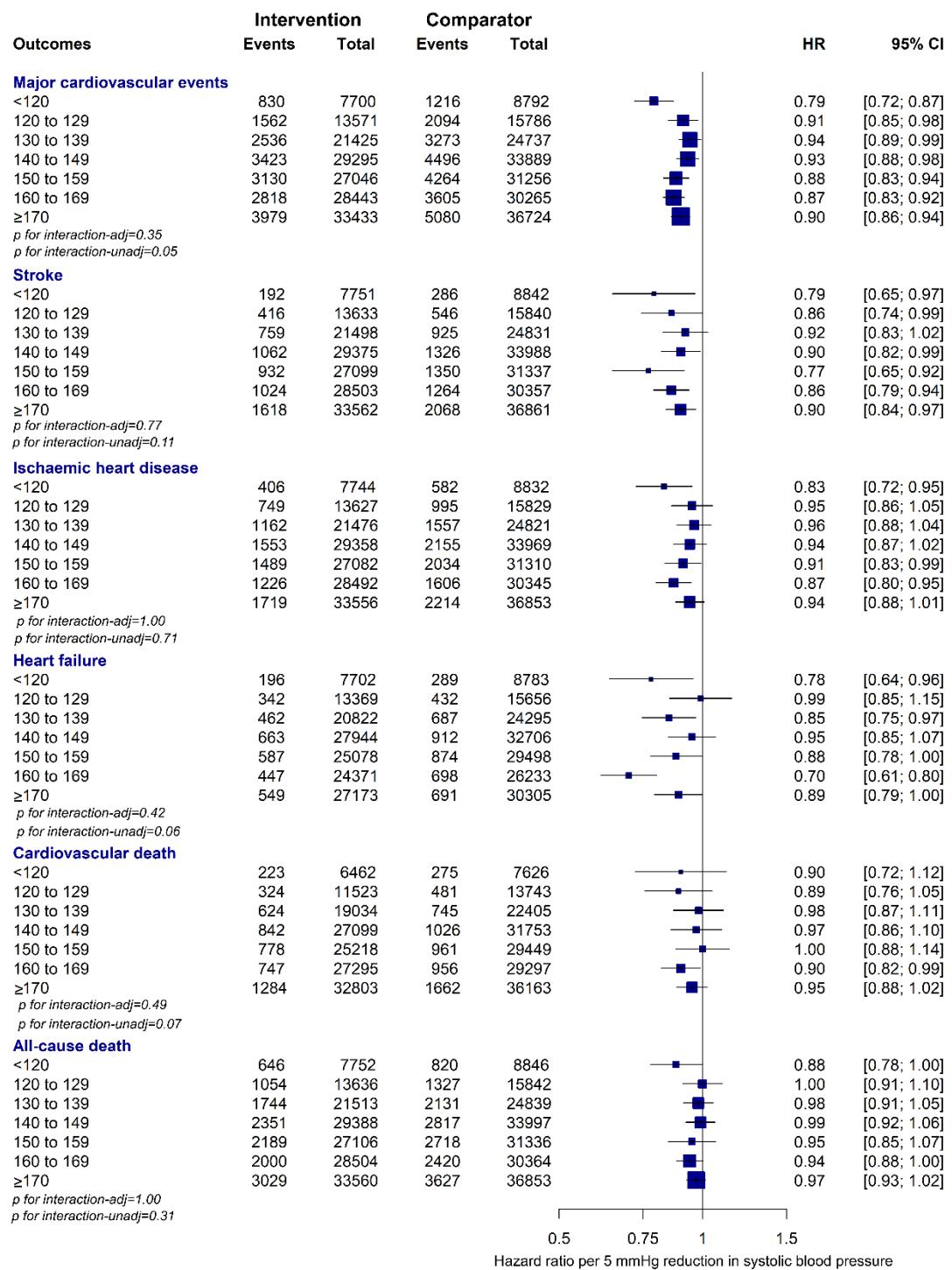


Figure S7. The unstandardised effects of blood pressure-lowering treatment on primary and secondary outcomes by systolic blood pressure at baseline.

Forest plot shows the hazard ratios (HR) and 95% confidence intervals (CI), separately for each outcome; p for interaction-adj: adjusted for multiple testing using Hommel's method; p for interaction-unadj: unadjusted for multiple testing.

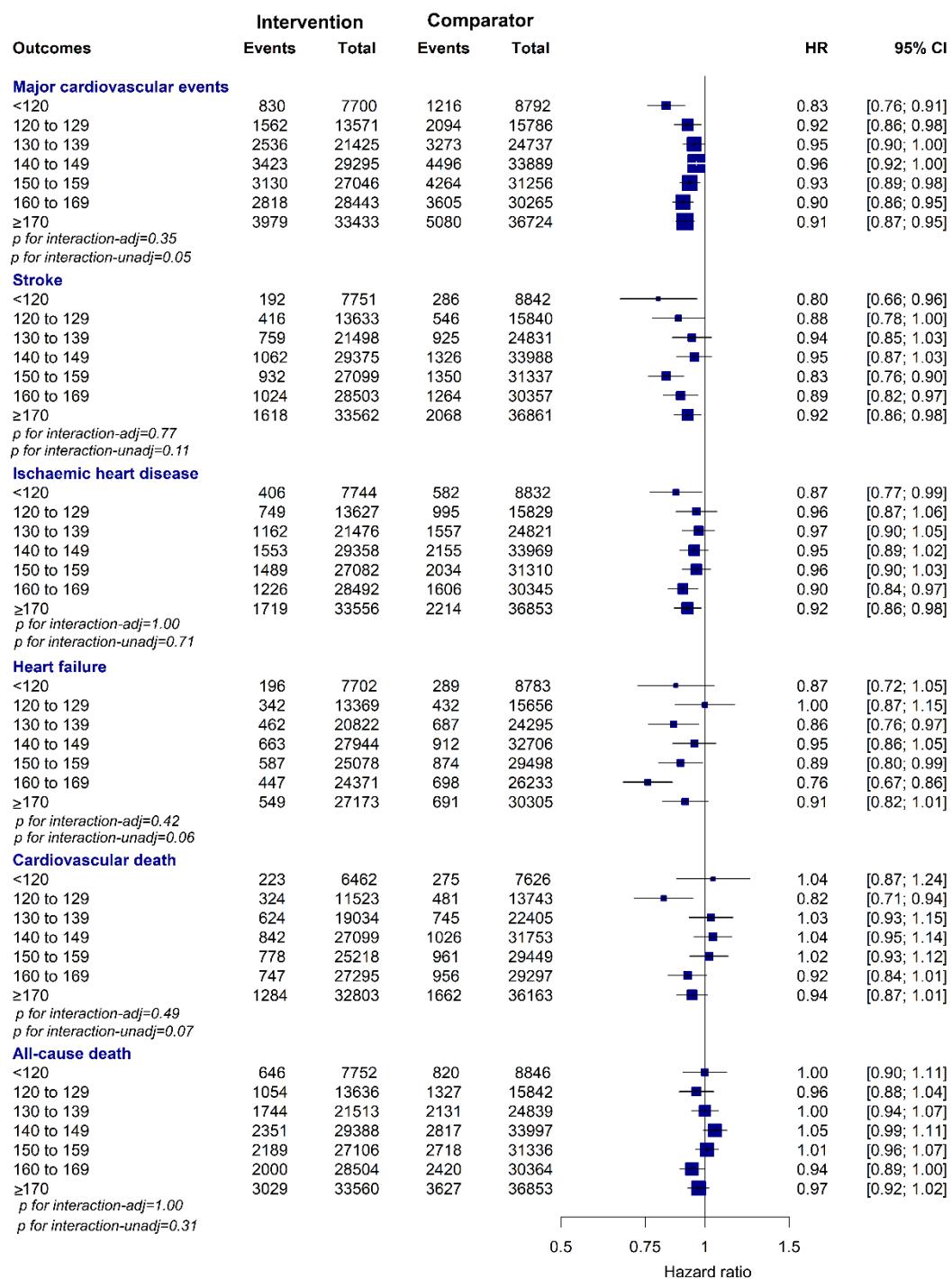


Figure S8. Effects of blood pressure-lowering treatment on primary and secondary outcomes, by cardiovascular disease status at baseline, excluding drug classes comparison trials.

Forest plot shows the hazard ratios (HR) and 95% confidence intervals (CI) per 5 mmHg reduction in systolic blood pressure, separately for each outcome; CVD: cardiovascular disease; p for interaction-adj: adjusted for multiple testing using Hommel's method; p for interaction-unadj: unadjusted for multiple testing.

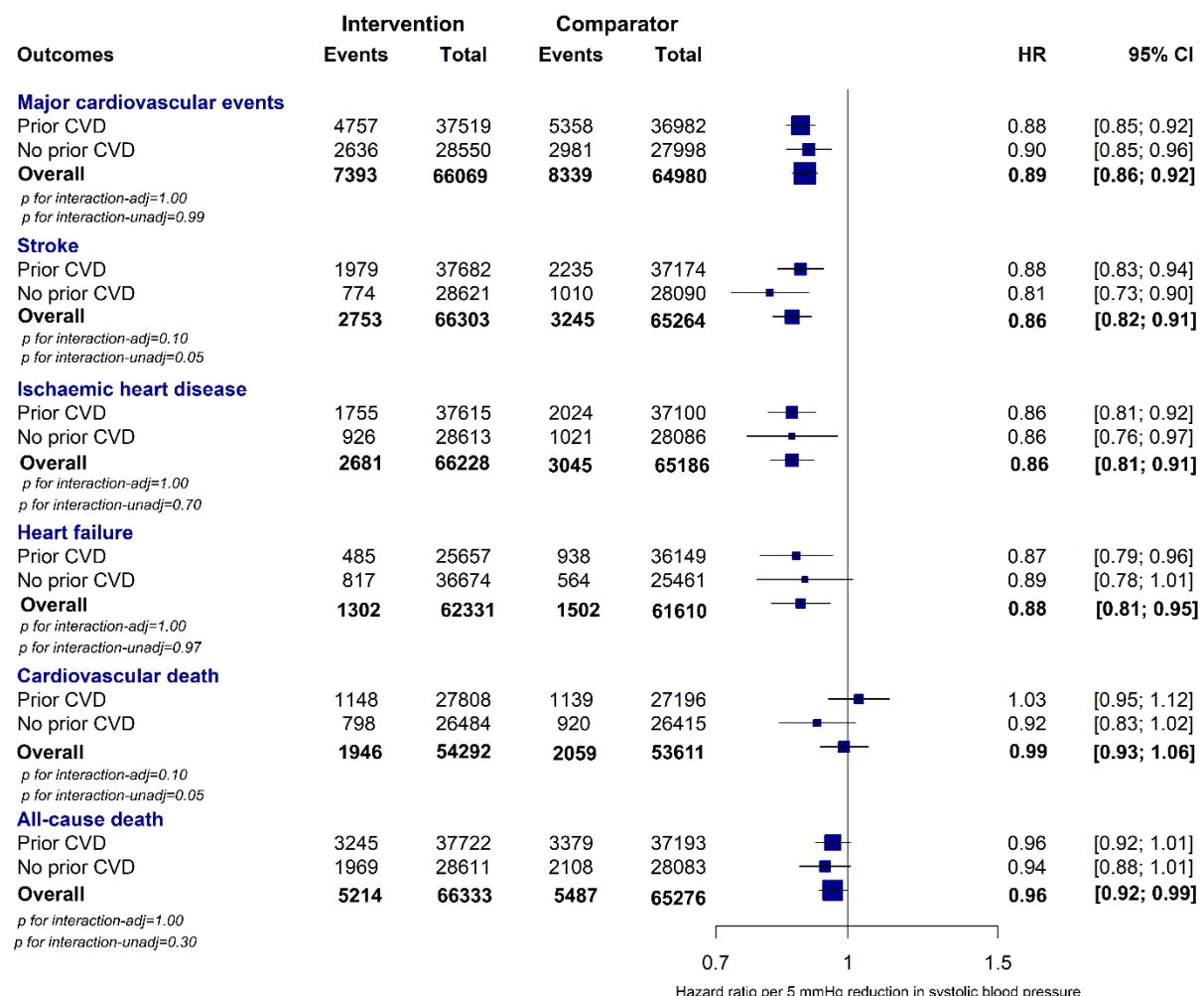


Figure S9. Effects of blood pressure-lowering treatment on primary and secondary outcomes, by cardiovascular disease status and systolic blood pressure at baseline, excluding drug classes comparison trials.

Forest plot shows the hazard ratios (HR) and 95% confidence intervals (CI) per 5 mmHg reduction in systolic blood pressure, separately for each outcome; p for interaction-adj: adjusted for multiple testing using Hommel's method; p for interaction-unadj: unadjusted for multiple testing.

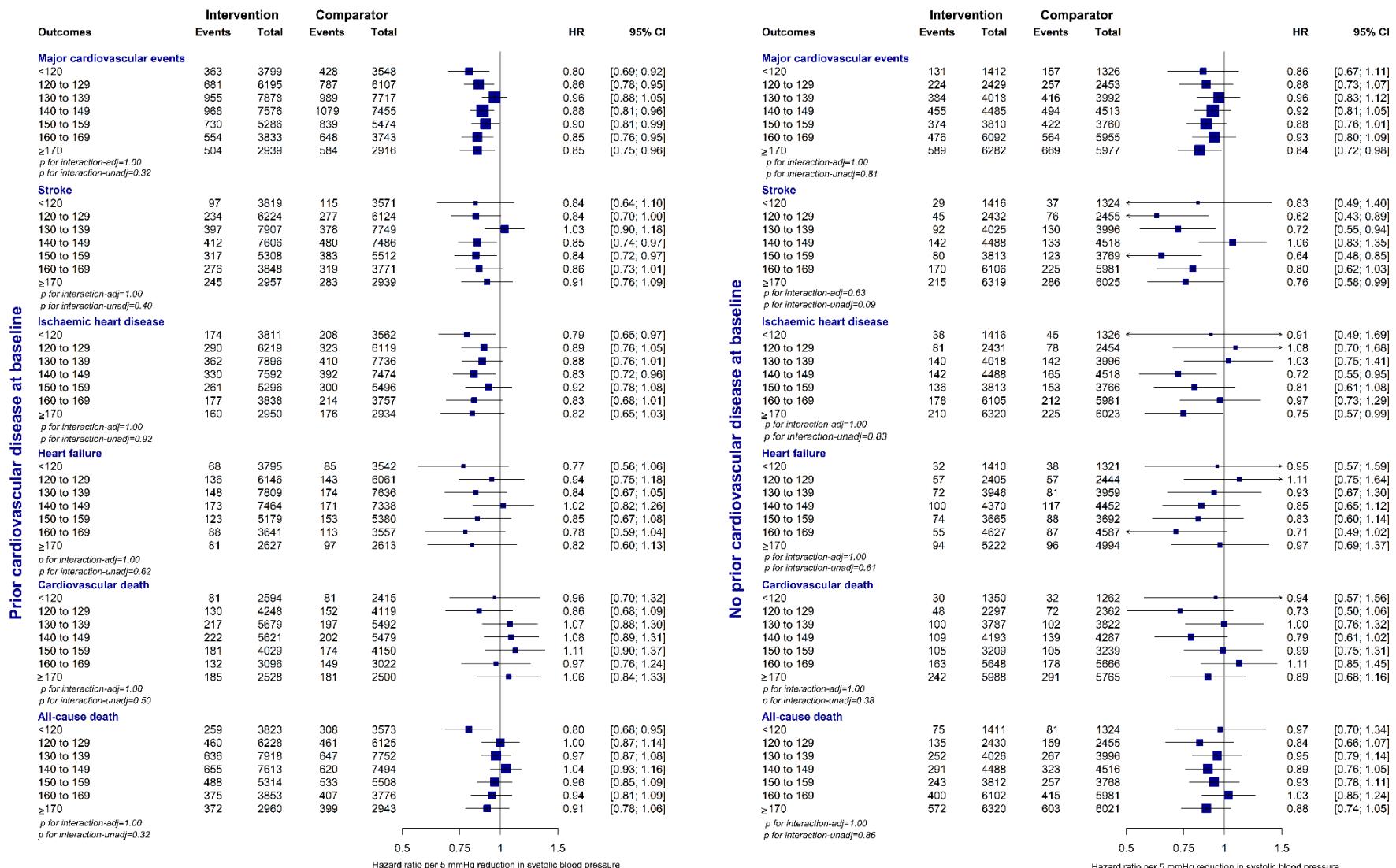


Figure S10. Absolute risk reduction for the effect of blood pressure-lowering treatment on primary and secondary outcomes, by cardiovascular disease status at baseline.

Absolute risk reduction (ARR) estimated using a Poisson regression model with identity link. The unit is absolute risk difference between treatment versus comparator groups and reflects mean of blood pressure (mmHg) reduction in BPLTTC; CVD: cardiovascular disease; CI: confidence interval; p for interaction-adj: adjusted for multiple testing using Hommel method; p for interaction-unadj: unadjusted for multiple testing.

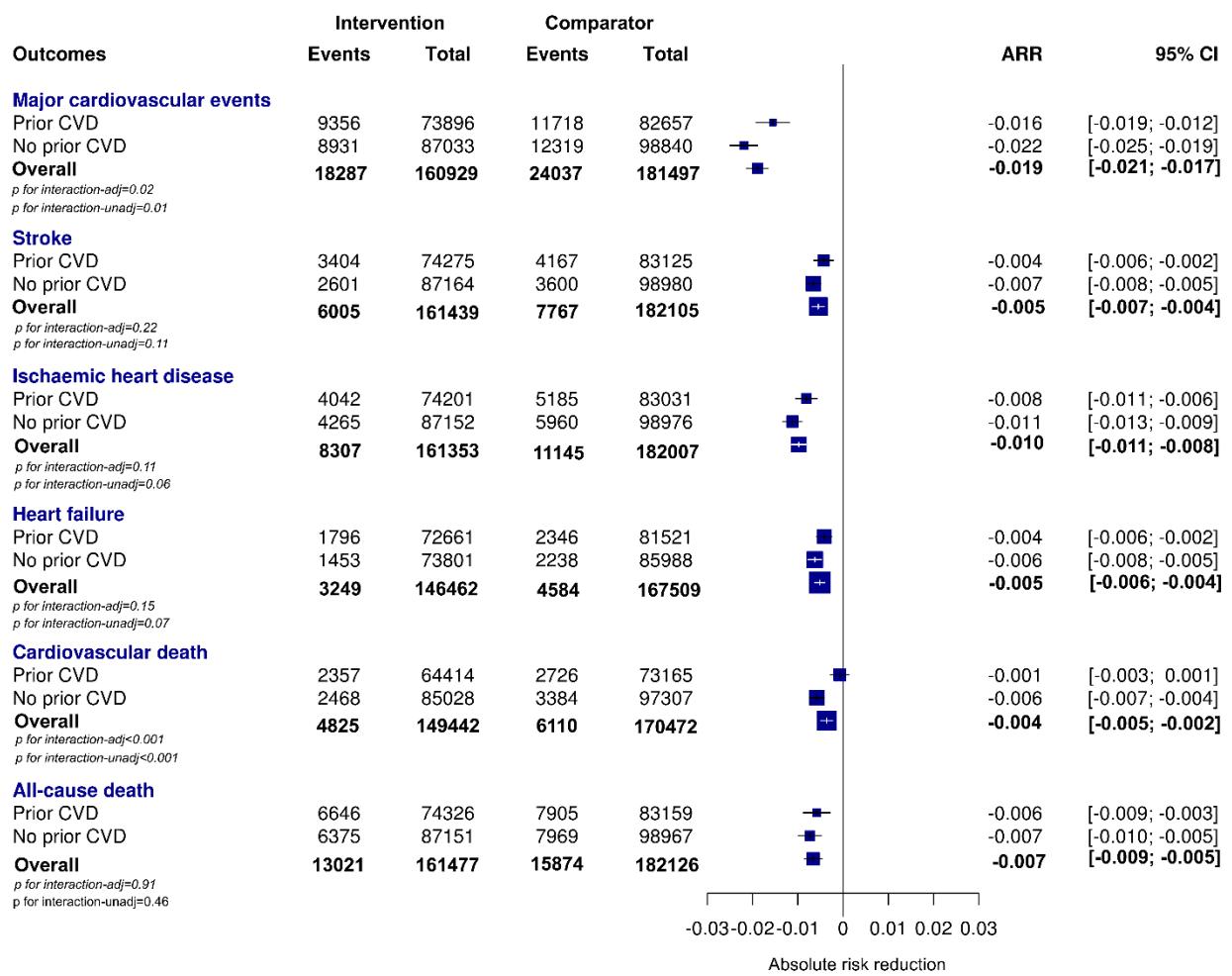


Figure S11. Absolute risk reduction for the effect of blood pressure-lowering treatment on primary and secondary outcomes, by cardiovascular disease status and systolic blood pressure at baseline.

Absolute risk reduction (ARR) estimated using a Poisson regression model with identity link. The unit is absolute risk difference between treatment versus comparator groups and reflects mean of blood pressure (mmHg) reduction in BPLTTC; CVD: cardiovascular disease; CI: confidence interval; p for interaction-adj: adjusted for multiple testing using Hommel method; p for interaction-unadj: unadjusted for multiple testing.

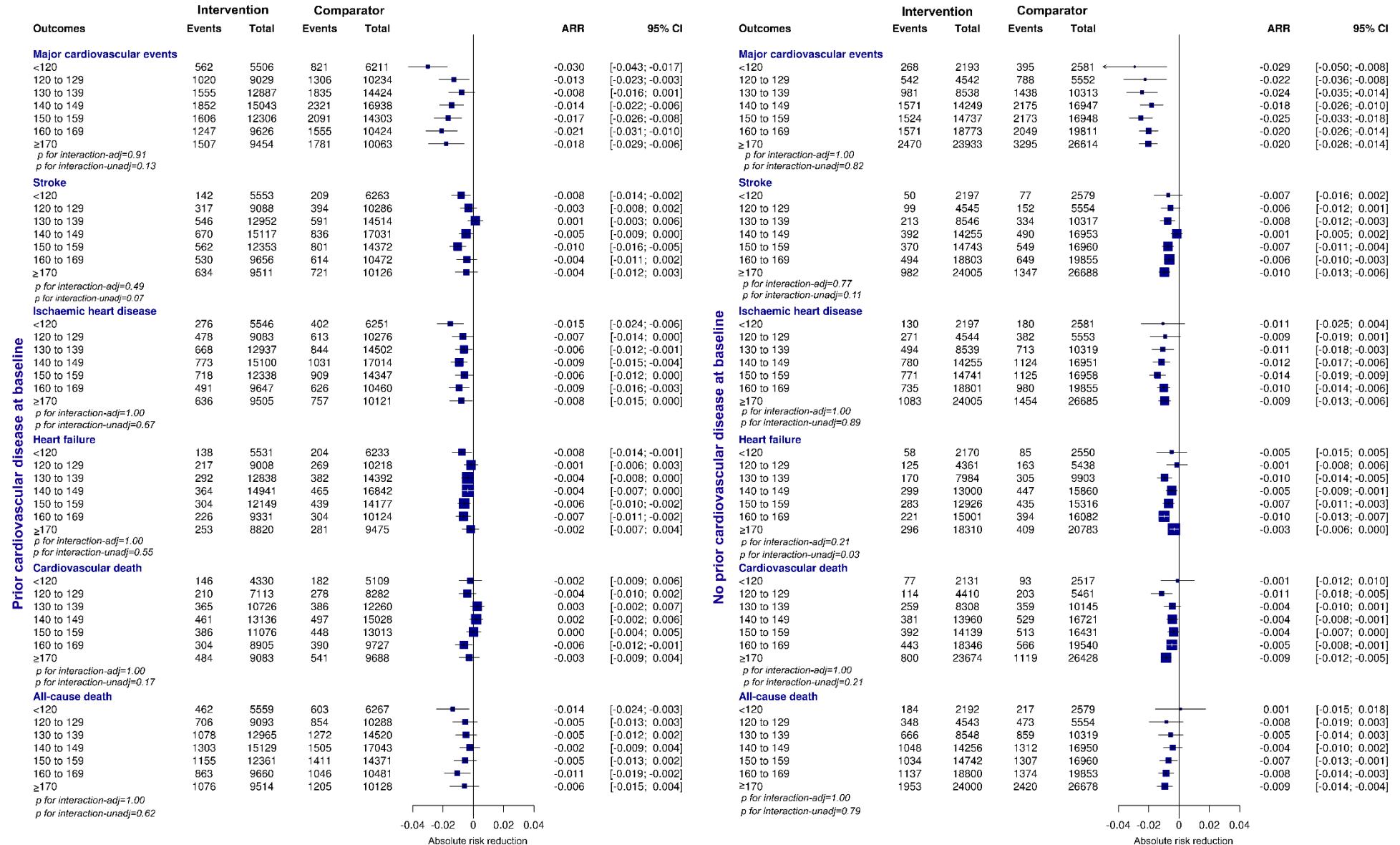


Table S12. Sensitivity analysis for the effect of blood pressure-lowering treatment on primary and secondary outcomes, stratified by cardiovascular disease status and systolic blood pressure at baseline, excluding the trials with risk of bias.

Forest plot shows the hazard ratios (HR) and 95% confidence intervals (CI) per 5 mmHg systolic blood pressure reduction, separately for each outcome; p for interaction-adj: adjusted for multiple testing using Hommel method; p for interaction-unadj: unadjusted for multiple testing.

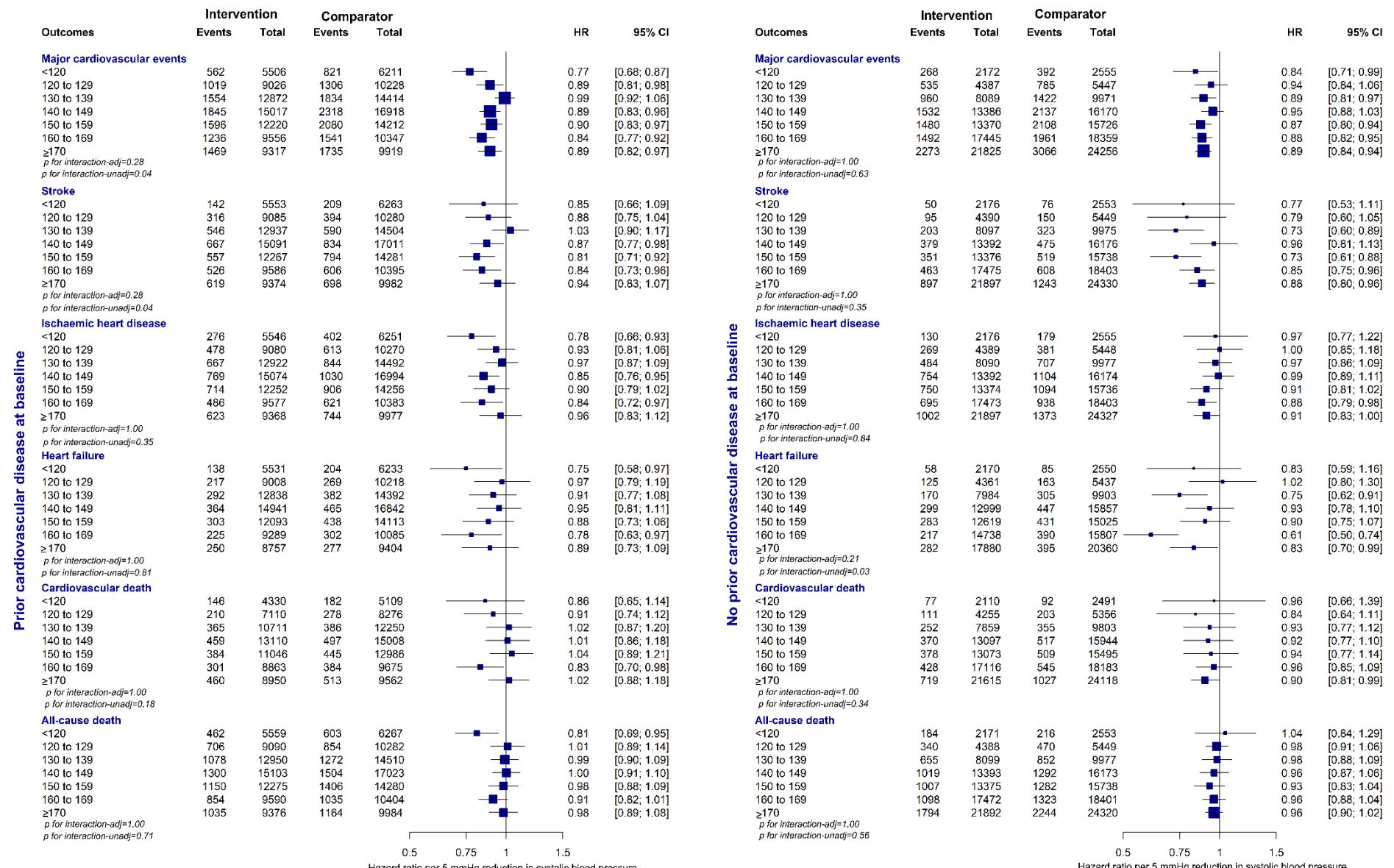
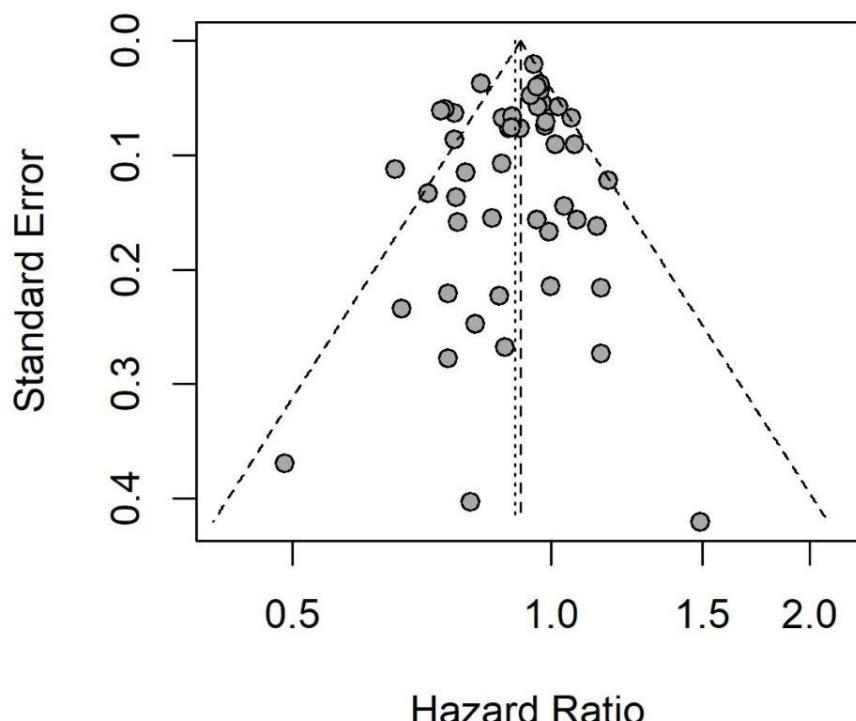


Figure S13. Funnel plot for assessment of publication (acquisition) bias on the effect of blood pressure reduction and risk of major cardiovascular event.

Linear regression test of funnel plot asymmetry: T-statistics = -1.18, df = 46, p-value = 0.24, bias coefficient - 0.42, standard error 0.35.



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